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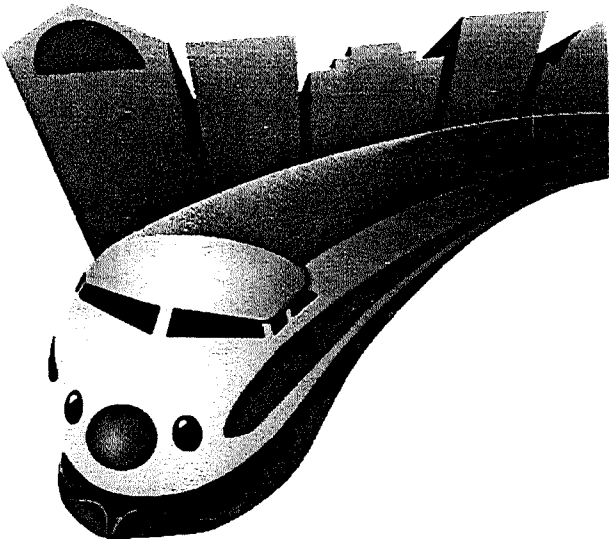
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Introduction ▶▶▶



*There is more poetry in the rush of a single
railroad train across the continent than in all
the gory story of burning Troy...*

— Joaquin Miller

WELCOME ABOARD THE A-TRAIN

A-Train is a simulation game built upon trains and railroad management—but that's just the beginning. A-Train exemplifies the relationships between transportation, business, and city development.

It starts out as a railroad game.

Design and manage an efficient and profitable transportation system for both passengers and freight.

Then it turns into a city-building game.

Influence and control the growth of a city by investing in land, then build offices, apartments, hotels, factories, golf courses, amusement parks, stadiums, ski resorts, and more.

Then it becomes a financial game.

Borrow from the bank to expand your real estate holdings. Invest in the stock market to build a financial empire.

Mastering trains, cities and money is the "triple challenge" of A-Train. There are six included scenarios/maps that can be explored and developed in any number of ways to keep you triple-challenged for a long time.

GOALS OF A-TRAIN

As with most Maxis products, the overall goal is to explore, experiment, and have fun. Specific goals are up to you, the player, but in general the things you'll want to accomplish in this game are:

- design and run a transportation system for both passengers and freight,
- direct urban development around the transport system,
- build and manage a successful business,
- dabble in the stock market, and
- get rich.



Air Monkey—Air brake repairman
Ape Wagon—Caboose
Beanery Queen—Waitress

WINNING AT A-TRAIN

If you reach a certain lofty cash total, the game is won—and over. However, we think that "winning" is more a measure of the success—and style—of your transportation network and your city itself, rather than an arbitrary figure or target—it's very much up to you.

You decide how big a railroad you want, you decide what kind of city and how much development it should have, and you decide how extensive you want your financial empire to be. If you're happy, we're happy.

LOSING

The only way to lose at A-Train is if you go broke, either by reckless spending and investment, or by not having enough cash on hand to pay your taxes or other debts when they come due.

ARTDINK AND MAXIS

A-Train was created in Japan by Artdink, and is the first game that Maxis has published that was developed outside of the company. (We have huge egos and think we're pretty good game designers, so if we publish someone else's game, it means we're really impressed.)

A-Train is a good companion for our Software Toys®—a quality simulation game with great graphics and a lot of depth of play. It allows for much experimentation—you are rewarded for your reasoning and your learning capacity rather than your reflexes. A-Train leaves much of the goal-making up to you, and allows you many ways to reach your goals.

THE HISTORY OF A-TRAIN

This game is actually Artdink's third complete version of A-Train, which was released as *Take the A-Train III* in Japan.

The first version of A-Train was released in Japan in April 1986 for the Fujitsu FM-series computer. It was later available for all the major home computers in Japan.

A-Train II was released in Japan in July 1988, and was published in the U.S. by Seika Corp. under the name *Railroad Empire*.

Take the A-Train III was first released in Japan in December 1990 and since then has been a consistent top-ten seller, winning the Best Simulation of the Year Award from *Login* magazine (well, actually it tied for first with *SimCity*®), and winning reader polls as their favorite simulation game.

Take the A-Train III, under the name A-Train (we dropped the 3 since there never was a 1 or 2 released in this country), is now published by Maxis, and, since you're reading this manual, it must be somewhere right near you, ready for you to play.

MAXIS ON A SOAPBOX

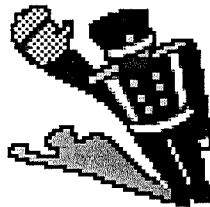
A-Train attempts to set an example of a company that is not only successful in the strict business sense, but also offers a service that helps people as well as making a positive impact on the environment.

With the self-feeding spiral of traffic and pollution plaguing most of the world's large cities, now more than ever the world needs efficient, affordable mass transit. The person or company that sets the example of how to run a privately held mass transit company at a profit would do the world a favor.

OK, we're off the soapbox now. Go play.

GETTING STARTED

A-Train must be installed to a hard disk before it can be played. For complete installation and starting instructions, see the A-Train Addendum.



SIDETRACK

The Ballad of Casey Jones

Come all you rounders I want you to hear
The story of a brave engineer;
Old Casey Jones was the rounder's name,
On a six-eight wheeler he won his fame.

Caller called Casey at half-past four;
He kissed his wife at the station door,
Climbed into the cab with his orders in his hand
Says, "This is my trip to the Promised Land."

Through the South Memphis yards on the fly,
He heard his fireboy say, "You got a white eye."
And all the switchmen knew by the engine's moan
That the man at the throttle was Casey Jones.

It had been raining some five or six weeks;
The railroad track was like the bed of a creek,
They loaded him down to a thirty-mile gait
And threw the southbound mail about eight hours late.

Fireman hollered, "Casey, you're going too fast.
You run the block-board the last station we passed."
Casey says, "Yes, but I think we'll make it through,
For she's steaming better than ever I knew."

Casey says, "Fireman, don't you fret.
Keep knocking at the firebox; don't give up yet.
For I'm going to run her till she leaves the rail
Or make it on time with the southbound mail."

Around the curve and down the hump,
Two locomotives were bound to bump.
Fireman hollered: "Casey, she's just ahead!
We might jump and make it, but we'll be dead!"

Around this curve he spied a train.
Reversing his engine caused bells to ring.
Fireman jumped off, but Casey stayed on.
He's a good engineer, but he's dead and gone.

Poor Casey Jones, he was all right,
He stuck to his duty both day and night.
They loved to hear his whistle and the ring of Number 3
And he came into Memphis on the old I.C.

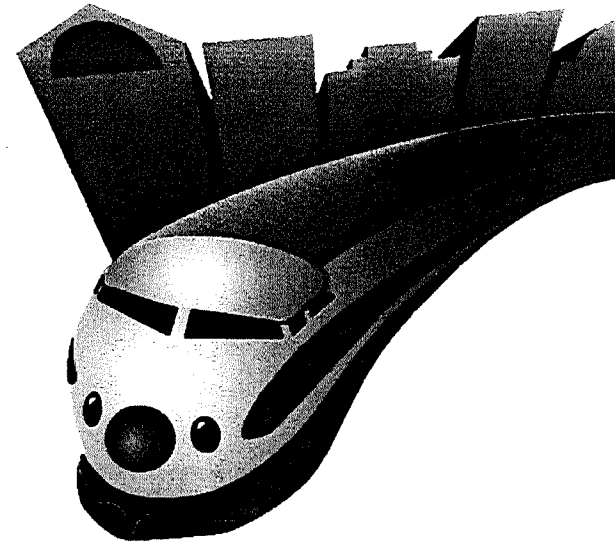
Headaches and backaches and all kind of pain
Are not apart from a railroad train.
Tales that are earnest, noble and grand
Are all in the life of a railroad man.

From the Encyclopedia of North American Railroad, Freeman Hubbard, McGraw-Hill, 1981.

John Luther "Casey" Jones met his fate at the helm of the Illinois Central Cannonball at Vaughan, Mississippi on April 29, 1900, running into a train that was late getting off onto a siding. Casey was renowned for the signature whistle of his train and his enthusiasm for punishing the rails at speed. The lyrics are originally attributed to Wallace Saunders, Jones' fireman, who jumped to safety as Casey remained steadfast at the helm. The song has undergone many permutations since.

A • T R A I N

Tutorial



*Trains are wonderful... To travel by train is
to see nature and human beings, towns and
churches and rivers, in fact, to see life.*

— Agatha Christie

ONBOARD TUTORING

The following tutorial will get your trains up and running and provide the groundwork for understanding some of the financial intricacies of the game. You'll find detailed explanations of menus, commands, investment suggestions and general gameplay advice in the Reference section of this manual.

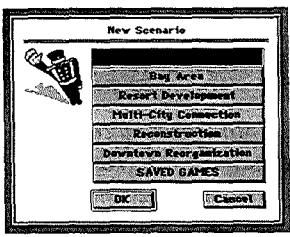
The screenshots in the manual are mostly from the Macintosh version of A-Train, except where specified. Menu functions and gameplay operations will perform identically for both the Mac and Amiga versions, but there may be occasional visual differences. The few instances of major distinctions between the programs will be elaborated upon in the manual. Your Addendum will contain detailed machine-specific information.

Please refer to your Addendum for procedures to install and start A-Train. Once the program is running, you are ready to begin your *training*.

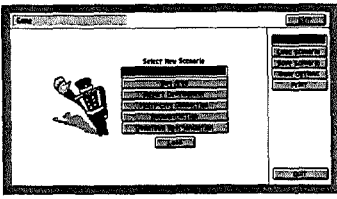
BEATING THE SYSTEM

After the title screen and credits for the game have been displayed, the NEW SCENARIO or GAME menu will open. When the menu is opened, the game clock stops.

On the Mac, click on NEW TOWN and click OK. On the Amiga, click on NEW SCENARIO, on NEW TOWN, and then on LOAD.

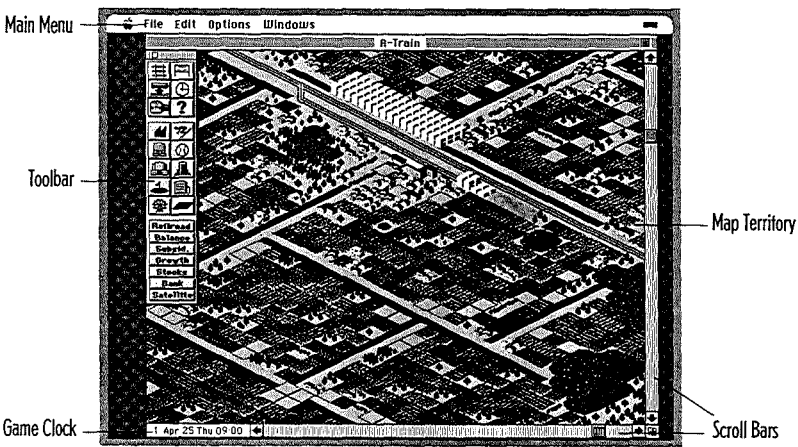


Macintosh

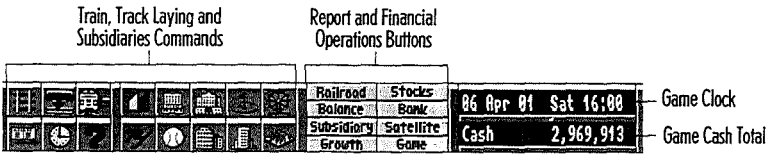


Amiga

You will now see the lovely map of your new railroad operation, accompanied by a moveable "toolbox" of menu icons and buttons, or a bottom-of-screen panel of icons and buttons. The Mac toolbox can be closed by clicking in its Close Box, and opened by choosing Show Main Tool Palette from the Windows menu. The onscreen running clock indicates the current fiscal term (which runs from April 1 to



Macintosh Opening Screen



Amiga Tool Panel

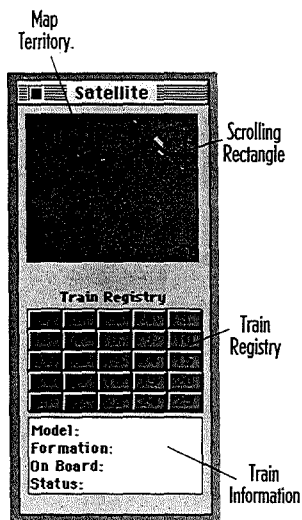
the present), and the month, day and hour. The clock is the measure for train scheduling, which will be discussed later in this Tutorial. The passing of time is illustrated by the changing patterns of light as day fades and night falls. The light changes can be turned off if you wish: On the Mac, open the Options menu, select Preferences, then click in the "checked" checkbox next to Do Day/Night Color changes; on the Amiga, click the Game Options button in the Game window and then click the Day/Night Cycle Off. There will also be seasonal changes, such as the appearance of winter snow, as the game progresses.

RAILROAD TALK

Has Whiskers On It—Designating a delayed telegraph message

Highball—Signal waved by the hand or by lamp in a high, wide semicircle, the meaning of which is to “go forward” or “get out of town at full speed ahead.” Derived from the oldtime ball signal on a post, raised aloft when the track was clear. To ball the jack is to make a fast run with a steam locomotive

Hitting The Grit—Falling off a car



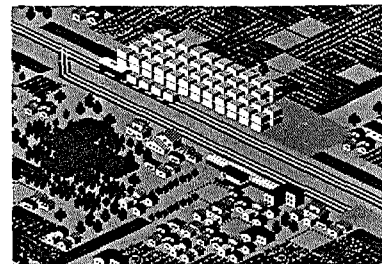
All of the maps provide you with at least one operating railroad, and some amount of cash. See the Cities chapter in the Reference section for amplification on the challenges each map presents.

Map One is one of the most open and undeveloped of the six scenarios, providing space for experimentation and risk. One of the goals will be to develop the “bedroom community” of its new town. Take a few moments to “mouse around” on the map to get a sense of your territory. On the Mac, you can use the scroll arrows and the scroll boxes to make incremental or major movements across the terrain. On the Amiga, you can press or press and hold on the keyboard arrow keys to move in discrete jumps or continuously scrolled distances in the arrow’s direction. If you approach the screen borders in any direction on the Amiga, the cursor will change into a smaller pointer. Clicking or clicking and holding on the left mouse button will cause the terrain to scroll in the pointer’s direction.

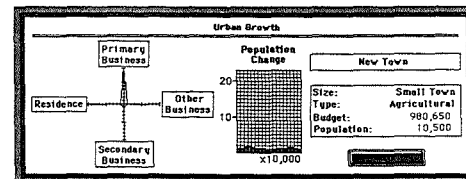
Clicking the Amiga’s right mouse button will cause any open windows to disappear, so that you are provided with more screen real estate to execute a command or get an expanded view of your terrain, without having to scroll or deactivate the command window. You might, for instance, have selected a site to build an amusement park, only to have the spot obscured by the AMUSEMENT PARK window. Click the right mouse button, place your park in the now open terrain, and click the right button again to restore the window. You can then close the window by hitting EXIT. The unshifted minus/underline key on your keyboard performs this same window-cleaning function.

You can orient yourself to the overall map boundaries by clicking on the SATELLITE button, which will display a small image of your complete map. On the Mac, the Satellite window can be moved around onscreen by clicking and dragging its Title Bar. You can also access the Mac Satellite window by choosing Show Satellite View Window from the Windows menu. The rectangle on the Satellite map captures the current territory displayed on the large map. You can drag the rectangle to any area and click, and the corresponding terrain will be displayed on the big map. Take careful note of the hills, rivers and lakes; terrain plays a significant part in your rail setup. The land is divided into small squares that we’ll refer to as “blocks.” The block is the measure for a number of A-Train procedures.

Use the Satellite rectangle to return to the existing train station on the map, then leave the window by clicking on the Close Box or on EXIT. There are both a freight and a passenger operation on your established lines, both running on the same track, both going off the map. Note that the freight train returns from its excursions outside laden with materials, which are deposited in the large pile at the station; if the storage place is full, it will pick up materials to be sold to the outside. Those are the construction materials from which commercial properties and other holdings are developed. Their placement and train transport play an integral part in your city development.



And city development is one of your goals. Click on the GROWTH button and note the statistics on your city’s status, particularly the population total. It is wise to periodically check these facts to see how rapidly your city is evolving. These figures give you quick feedback on how your moves affect the city scale. Click on EXIT to leave the window.

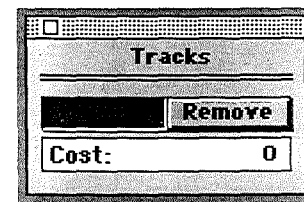


TRACK IT DOWN

Track laying can be a trifle tricky at first, so we’ll experiment a bit. Scroll to one of the undeveloped areas on the map, so that you can put down and remove some track without destroying existing development. Click on the railroad track icon and a small TRACKS window will appear. Make sure that LAY is highlighted. Click the mouse on any terrain block and you will see it highlight; these blocks are the units of measure in this survey of your terrain.



Shift the mouse in any direction and you will see a highlighted line follow your movements. The highlight will reflect any curves when you deviate from a straight line. You can see that by slight maneuverings with the mouse, the display of your proposed line will change its angle and course.



Draw a straight line from left to right about six blocks and then click. A strip of track will be put down in place of the highlight. Click on REMOVE, and click on either end of the track and drag to its other end. The beginning block will highlight and a highlighted line will be drawn, just as when the track was placed. Click again and the track will be removed and replaced by cleared land.

You can see that the figure in the COST box changes with each block over which you lay track. This number reflects the purchase price of the land, and the track laying/removing charges. You will still own any land from which you remove track.

Hint: If you are trying to put down some lines and your track tactics don't result in the desired direction, you can cancel the command by clicking LAY again. Then try to lay the railroad by clicking first the destination point and then the beginning point. The railroad should turn to the opposite direction.

For curved track, if you can't achieve the desired angle with a single stroke of the mouse, you can lay piecewise segments of straight track, connect the curved joint, and then connect additional segments. Of course, it's more expensive if you mistakenly put some down, only to remove it later.

THROWING YOUR TRACK A CURVE

Curving track can require some wily maneuvering, but it's a skill that will serve you well in future track laying. Try running a line from east to west and then have it veer sharply up or down. Also try a few wide, looping curves. If you haven't established a practical line position, you'll get a nasty message from the track layer or construction manager. You can see that controlling the curve isn't always easy, but small mouse motions can usually establish the desired angle in a highlighted planned line. If you have difficulty getting a curved length properly positioned, do it in short one- or two-block segments. Try removing curved track as well.

Hint: When trying to place a line segment, it's easier to get a block to highlight if you click directly in its center.

If a track removal path won't follow any curves that are on your line, you will have to remove piecemeal sections. It is expensive to rip track, so in the real game, plan carefully before you lay your line. Experiment with curved and straight track laying and removal until you have a more natural feel for it.

Union soldiers in the Civil War destroyed Southern rails by heating them and twisting them around trees. The mangled rails were known as "General Sherman's neckties."



GETTING BACK ON TRACK

When you've untangled this track-tying rope, scroll the map so that your original station is near the top and center of your screen. We're going to run a new line from here to the east and then south, so that we can use the existing commercial market of the town, without having to schedule trains around the existing lines.

We'll establish two new lines on a connected track near the established lines. These will provide us with a small passenger market, and let us acquire some construction materials to spur development around our new lines. The schedules and routes of the original line are fixed and can't be adjusted, but additional trains can be laid down separately or integrated and controlled.

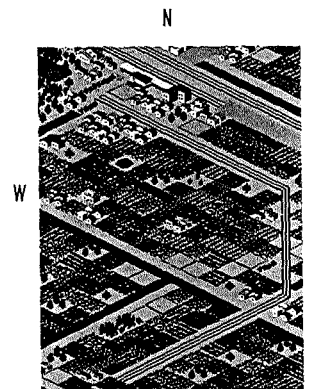
Click at a spot a couple of blocks below the station. Move the highlighted planned line from west to east about five or six blocks, and click to place the line. You can add to existing track by clicking the mouse at track end (the initial block will be highlighted), and moving it to your new terminus. Click at the eastern end of your line and move it east a block or two and then draw it down southward to a few blocks from the bottom of the screen.

The curve southward should be indicated in the highlighted planned line. You might have to do some wiggling to place it so that it "sets," but when you have positioned the line to your satisfaction, click at its end. This will establish the track (or you will get a message informing you if you have laid a line in an unsuitable position).

When you are laying track you often have to make many adjustments for geography—avoid hills and try to use fairly straight segments, since curves are more costly. You can click the LAY command again to cancel a planned line if you haven't yet clicked the mouse to place it. Track laying can also be aborted by hitting the Escape key or the Space Bar.

Look at your new track in the Satellite view to see it in relation to the original map. (On the Amiga, you must exit the TRACKS window to use the Satellite view.)

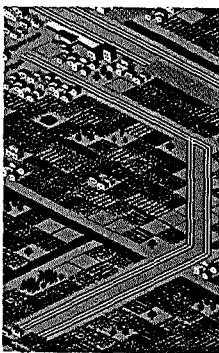
Let's lay a second line that connects on a spur from the first. It is actually easier at the beginning of games to lay two close-but-separate lines, freight and passenger, so that you don't have to be concerned with switches, but we'll get your switchin' feet wet early, so you won't be fearful of those complex waters later on.



S
First New Line



The Real Estate Agent will ensure that your section of the Brooklyn Bridge has a view.



Second New Line

Connecting track must be first established on a diagonal line from existing track. Position your mouse so that it is about two-thirds of the way down the first section of your track. Highlight the first block and shift the mouse down so that your second line runs parallel and one or two blocks to the west of your first track. Move the mouse until you reach the terminus of your first line and click to set your dual line. The result should look like the Second New Line diagram; minor variations in placement aren't important.

TRAINING YOUR FIRST TRAIN

There are a number of approaches you can take to organizing your initial railroad, such as buying and placing the stations first and then arranging your trains, but we'll get a train up and chugging right away so you'll have something to brag about.

Exit the TRACKS window by clicking its Close Box or EXIT button and click the icon that looks like the facing end of a train. You will see a Rolling Stock Market display of all the available train models, a chart detailing the statistics of the chosen train, and a train registry showing what trains are already in operation. Amiga users can scroll through the train stock choices using the scrolling arrows on the right of the Rolling Stock Market window. The train scrolled into the central highlighted "slot" becomes the selected train.

Subsequently purchased trains on this and other maps will be highlighted on the registry, but you cannot adjust Map One's existing trains, and thus the entire chart is open.

To buy a train for your new line you must first choose an unused train number from the registry (#1 has a lovely ring) by clicking on it, and then assign the number to a particular train chosen from the train

chart. Mac users will see that as they click on the various small pictures of the trains, a larger picture of the selected train will appear at the bottom of the window along with its vital statistics (model, capacity, cost, etc.).

Your first line should be a freight line. We recommend the dashing GP 40 with the crisp Maxis Lines logo. (You may want to start with a cheaper, lower-capacity freight in a real game.) Once you have chosen a train, make sure the BUY command is highlighted and then click CONFIRM. Amiga users can buy the selected train by making

sure BUY is highlighted, selecting an unused train number, and clicking on TRANSACT. The train is now yours, registered by its number, which is highlighted or underlined on the registry chart.

Click EXIT to close the Rolling Stock Market. Then click the icon that looks like a little train with an arrow pointing down to tracks. You'll find that the new train number has already been chosen in the registry, with its train stats displayed. (In the future, you can use this window to select other numbers if you want to make changes to purchased trains.)

Make sure that #1 is highlighted and then place the train near the bottom edge of your eastern line by positioning the pointer over a spot on the track, which will display the highlighted box. The train will appear on the place clicked. If the place isn't appropriate, a scolding message box will appear. The Mac PLACE button will now say NEWDIR to indicate the directional change option now available.

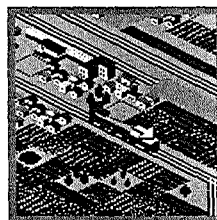
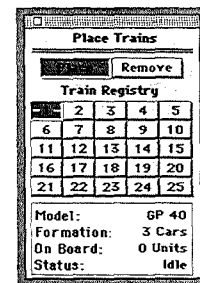
The new train will have two arrows, one in front of the train and one at the back. The white arrow represents the train's current direction. You can click on these arrows to toggle the direction; for now, point its travel up the line towards the original railway. The train starts moving after you close the PLACE TRAINS window. You got yourself a railroad!

Hint: When expanding future lines, it might be convenient for you to place several trains at one time—multiple track placements—using the SATELLITE view scrolling, which lets you move around the map very quickly.

GIVE YOUR TRAIN A HOME

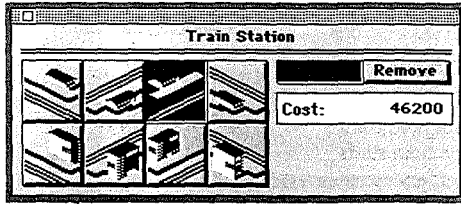
You'll see your train making its merry path from north to south without relent, on the outside line. Let's give it a place to pull over and stretch its wheels, and also pick up some business in the meantime.

All maps will start you with at least one station on a line. One solid approach for a line with only one station is to establish another on the same line some distance (at least 15 or 20 blocks) away, preferably near some development—if there is any—so as to provide both materials transport and some passenger income. (Passenger fare increases with distance traveled.) We're dealing with freight right now, but we're going to put a passenger line down as well.

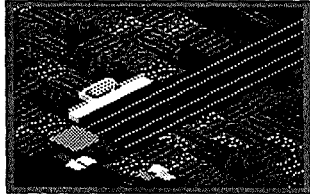


There isn't a preset "ideal" distance between stations for running passengers. Dependent on development factors, set the stations close early in the game to reduce track laying expenses, and when there is more passenger traffic, remove close stations to get the increased fare received for longer trips. There are many strategic gambits concerning station development; refer to the Trains chapter in your Reference section for details.

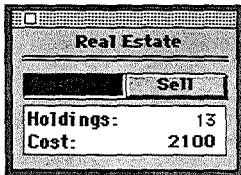
For simplicity's sake, let's establish a station at the southeast end of our new line. You can add additional stations to your original line later. The large stations, the ones with tall buildings attached, are more expensive, but their larger passenger processings provoke the simulation into faster city and urban road development. Scroll to the southern end of your line and click on the icon that looks like a little sign. Trains will stop running when this TRAIN STATION window is opened.



You are given a choice of four small and four large stations in various orientations. Click on a small station that will face the tracks from the west and then position the mouse at the southernmost edge of the track. (Station orientation is a factor in city development; see the Crossroads chapter in Reference.) Stations can only be placed on diagonal segments of track



Your New Station



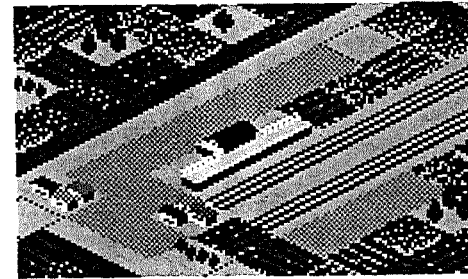
with no curves. You'll see the station outline in highlight, which will occupy at least three blocks. Click when the position is right, and the building will settle nicely into place. When lines are this close, they can share a single station.

It's necessary to immediately make an area for materials storage near the station, so that you can pave your kingdom. You need to buy some land adjacent to your station for this storage. It's actually a very sound move to buy up a lot of land around your stations quite early in the game, because this land's value skyrockets in relation to later development. If you truly have an eye for the long-term, buy land in areas where you might concentrate development later; it's sure to bulge your future wallet. You probably shouldn't spend too much too soon, though, because start-up rail costs are high.

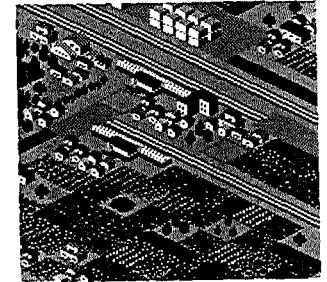
Click on the icon that looks like a small (and somewhat warped) block of land. A submenu window will open with buy and sell commands, a figure revealing your current holdings and a cost figure that will tally the price of prospective land buys. The prices for

the individual blocks of land will be revealed when you move your pointer over them.

Land without buildings on it is cheaper; buy accordingly. Click the BUY command; the mouse pointer will become a highlighted block. Click on several blocks of land in a line near your western station. You can buy more later if the traffic's hopping. You can also buy property in the general periphery of the station. Leave any residences and buildings be. You can see that when you purchase the land, its surface is cleared. Cleared land with a black highlight around it is owned by another company. Exit the REAL ESTATE window.



Buy land for materials storage near your station...



and place a second station

Scroll (if necessary) up north near the map's original station and open the TRAIN STATION window. Place a station at the northern end of your line, which should be just a few blocks below, parallel to, and a touch east of your original station. You will have to build over some existing buildings. This station's placement allows you to "feed" off of some of the existing materials brought in from the outside and to transport them down to your southern stations for city development.

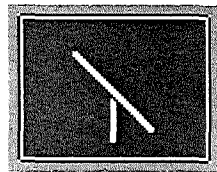
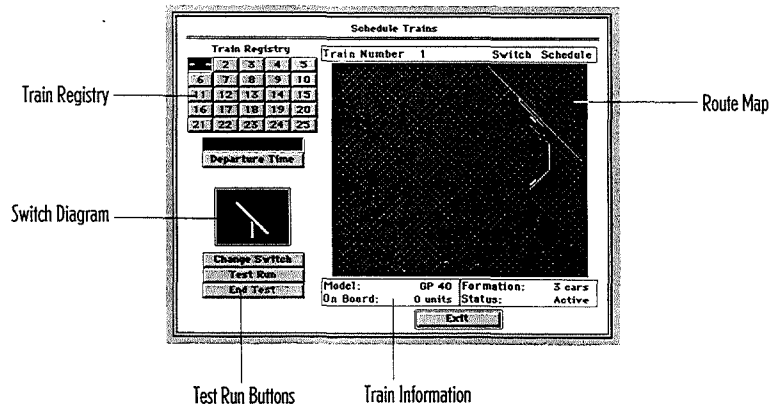
Now your train's all dressed up with a place to go, but you need to tell it where and when. Exit the TRAIN STATION window and buy some land near your new station for materials storage.

The summit of the Manitou & Pike's Peak Railway is 14,147 feet, the highest railway (that is not a through line) in North America.



DON'T FIGHT; SWITCH!

Click on the icon that looks like a little clock. This opens the SCHEDULE TRAINS window, displaying the registry chart with your highlighted train number and a route map that displays the operating trains, their tracks and stations in miniature. Clicking on the number of any purchased train will highlight its image at its current position in a small white square on the route map. Info on the selected train is underneath this map. This map can be a particular asset when you have many trains running and their respective numbers are not so fresh in your mind.



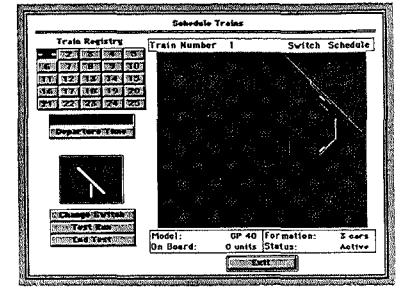
Switch

We'll set schedules when we place your passenger train, so ignore the DEPARTURE TIME command; click on SWITCH. A small diagram of a switch will be shown in the box below the command.

Move the mouse so that the pointer is near the junction of your southwest line and click. A highlighted box appears on the map at the switch's location and the switch display shows its current position. Click on CHANGE SWITCH to direct your freight to your southwest track. The switch will be redirected on the route display and the game map.

Click on the TEST RUN command and you will see the altered route on your route map, with your train represented by a swiftly moving dot. You must click on END TEST to halt the test demonstration.

Exit the SCHEDULE TRAINS window and watch the movement of your train. You'll see that it will soon start transporting materials to your southern storage place, or—dependent on availability of materials near your original station—taking them away. You can redirect the course of your train through the PLACE TRAINS window. Clicking on its number will scroll the screen to your train, which will display its directional arrows. Sometimes materials won't be available and your freight will begin to take materials away from your southern stations. You can use the arrows to send your freight back to deposit materials it was going to take away.



Switches, scheduling and all their intrigues are discussed in more detail in the Trains chapter in the Reference section. You will need to become a competent switchmaster and scheduler when you place your passenger train.

For now, let #1 run freely, as long as it is depositing construction materials at your southern station. Those blocks are the flagstones on your road to fortune.

THE PROPERTIES OF PROPERTY

This part of the tutorial will guide you through the basics of the building trade in A-Train. There are many stratagems regarding development around your stations and subsequent city expansion. All situations are variable according to the existing level of map development, your cash resources, and your approach to growth, be it devil-may-care or cautious. For tutorial purposes, we'll just give you some fundamentals on property development, its effect on the population, and how the simulation responds to your decisions. All of these matters, including a chart of development expenses for each subsidiary, are expounded upon in the Cities chapter of the Reference section.

Of critical need now are those construction materials, the stuff your dreams—and buildings—are made of. Construction materials are the "flour and water" from which all buildings are constructed and from which the simulation builds. You will see them start piling up near your station not long after it's built (as long as your outside lines are bringing them in). The pile will shrink and grow dependent upon the movement of your new freight line and the materials use of your

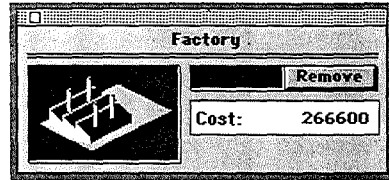


initial trains. When you've built up a storehouse of materials, you can do some property development.

Of course, you can rather cleverly relieve some of these materials anxieties by making some of your own. Why not build a factory nearby to produce the little devils for you? (It is better early on to rely on materials brought in from the outside and not to build an expensive, high-maintenance factory, but we'll do it here to demonstrate how they work.)

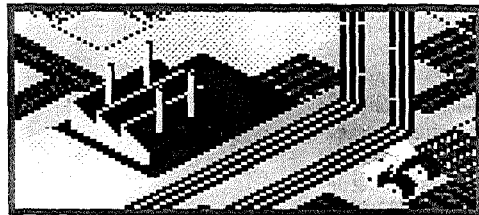


Click on the icon that looks like an old-fashioned factory. (Actually, to me it looks like the side view of a bishop's hat after a hurricane, but I did have a rough childhood.) The FACTORY window will open displaying an image of a factory with BUILD and REMOVE commands. Click on BUILD and position your pointer in the territory south of your northern station, but within about eight blocks of the track. You will see the land costs change as you move your mouse. Click when you've found a spot to your liking.



You can't utilize the factory materials unless they are first transported by your freights to your storage place, so keep that in mind—the direction of utilization is towards your southern stations. You can, however, use materials directly from the factory if you build within 10 blocks of the factory. You can remove the factory when you have sufficient materials; the maintenance costs are high, and are charged to you even when the factory isn't producing. Factories do, however, also provide employment for your citizens.

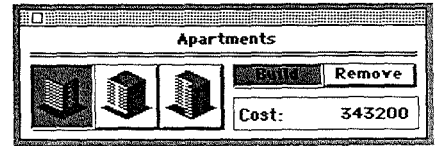
If there are placement problems for any property development, you might have to face the Construction Manager, who will inform you of difficulties in a message window. Change the site selection if you can't immediately place the factory. It takes 20 materials to build a factory, but that sacrifice is softened by your realizing that all A-Train factories are non-polluting.



Your New Factory

Right now, the only things your train is picking up are construction materials and flies, so let's do some developing—environmentally conscious, of course—with your passenger train in mind.

Click on the little squat building icon that has a little companion building on its right side. This opens the APARTMENTS window. There are no differences in operating expense or income among the three styles, but their initial purchase increases in expense from left to right. Choose one, and find a good site on the map near a station to house some hard-working families. All of your initial property developments should be close to the station, since it increases their value, surrounding property values, and centralizes initial development.



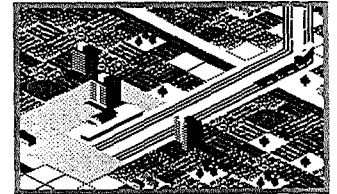
You might want to place your first apartments near your eastern track, if you don't want them to have to see the factory out their front window. Click on a block to place their new homes. You will get advisory messages from the simulation if your placement is unsuitable or if you don't have enough construction materials. (Apartments require eight materials.)

Building apartments indirectly "primes" the simulation to develop other buildings around yours. Early rapid buying and selling of apartment houses does not in itself provoke more rapid development by the simulation, though you can parlay the income from sales to buy more companies and land, which brings up population totals, which does provoke the simulation to build. Build a few apartment complexes near the station.

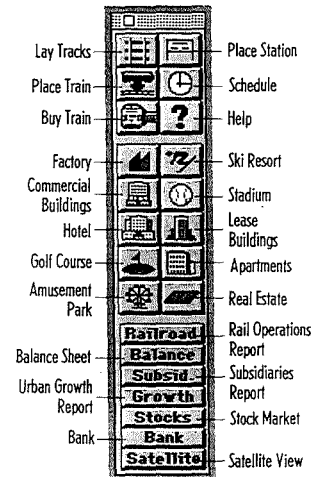
You can see from touring through the property icons in the Toolbox that you can truly fill the landscape with properties galore, but all these decisions must be made in the shrewd light of company benefit and profit, so don't go hog-wild. You should put down some commercial or rental property nearby so your residents will have someplace to work. Avoid building or buying land directly behind your station without later selling it, because that is where the simulation will build roads when your city expansion is really cooking (if you have built with large stations).

ESTATES AND THEIR REELINGS

The simulation will produce additional residences as soon as you reach a certain developmental scale; you might see the program clear some land first, and then fill it with houses after a materials deposit. You can make this happen more rapidly by buying real estate near your stations and then selling it not long after.



Place some apartments near your southern station





Your guests will be happy in the hands of the Hotel Manager.

Clearing land by purchasing it removes one step in the simulation building process by making it easier for the program to build after you sell the land. Be advised that development isn't immediate.

The program can also be kick-started by selling all old subsidiaries and buying new, but don't buy anything like golf courses or stadiums until you have an urban base. However, constant speculation in subsidiaries will eventually result in a "There are no buyers" message. Check the "Look At Your Report Card" section below for details on buying and selling assets.

You might have to take an initial loss on these sales, but once you have developed the area around your station a bit, and there are available materials, the program will start popping out houses and small commercial buildings, often where you've just made a transaction, and you'll have that warm glow that only a mother knows.

GET YOUR EXPRESS ORIENTED

You can't expect your new residents to walk to work, and what about when Grandma wants to visit from the Great Beyond outside the map's borders? It's time to be a prime mover in the ecologically conscious (and hopefully, logically profitable) world of mass transit. We'll place a train on the outer ribbon of your existing line so that your passenger train enjoys the same rights (and rites) of passage as your freight.

Open the Rolling Stock Market and buy one of those sleek little numbers you've always coveted. The AR III, fourth from the top in the third column, is recommended for its efficiency, but it might be a touch expensive now, so you may want to buy a cheaper, lower capacity train (perhaps the handsome CF Lines FP 45 right above it) while your town's still in its infancy. You can always replace existing trains with faster, higher-capacity ones when the going's good.

Anyway, risk some dough: name your risk #2, buy it, and place it on its line. Make sure the switch directs it down the eastern route. Now that you have two trains with a shared line, scheduling becomes a bit more dicey. Periodically check the number of passengers in the Satellite view by train number once your train is running. (The display will center on the selected train.)



TIME AND CHANCE

One of the central profit maxims of A-Train is that your departure time must be set at 8:00AM in the residential areas and at 6:00PM (18:00) in the urban areas in order to suck up those happy commuters and their happy dollars. As you can see from this map, it isn't exactly a bustling urban community yet, but let's plan for your future. Exit the PLACE TRAINS window and click on the SCHEDULE TRAINS icon.

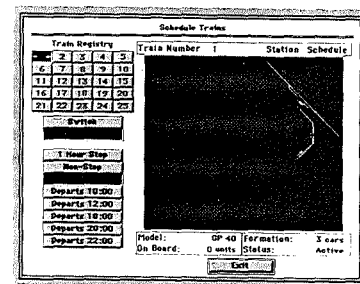
Click on #2 in the chart and select DEPARTURE TIME. A chart of times will be displayed. Move the mouse toward the image of the southern station. Cross-hairs will converge near the station. Click to highlight and establish this station as the initial departure site. Click on DEPARTS 8:00.

Click on #1 and set your freight's southern station departure time for 18:00. For now, leave the northern station at one-hour stops for both. These settings will make your trains travel to these stations, wait until the designated time (picking up or dropping off passengers and freight and not using expensive fuel for those down times) and then push their cargoes.

Were you to run separate lines, it wouldn't be necessary to set a schedule for your freight, since it can perform constant pickup and dropoff without losses in profitability. You might have to remove and replace your trains several times or set their directions differently so that the schedules are synchronized. You may experience a few collisions at first, but they only result in frozen trains and a delay in service, with nary an injury to worry about.

Later, you can adjust schedules for more map-specific events, such as increased development in one area, which hikes passenger totals (or make the switch to a larger-capacity train). Check on running passenger totals in the train stats boxes in the Satellite window; you'll probably see many more passengers from your northern station if you also set it at 8:00AM, but you'll have to fuss with your freight's schedule in order to coordinate both.

For now, this schedule just keeps the trains out of each other's way. Also, if your construction materials just begin piling up and you haven't the funds for much building, replace your freight train with another passenger train to try and pick up some extra passenger profit. Test different schedules and periodically check each train's capacity in the Satellite view at different station times to collar the biggest payload.



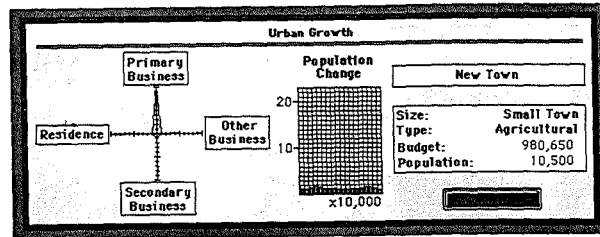
RAILROAD TALK

Biscuits Hang High—Region with scarce food handouts
Bug Torch—Trainman's lantern
Car Toad—Car repairer; also car tonk, car whacker, car knock

Later, you can boost profits by increasing track length and adding another station on the line (larger stations stimulate greater urban expansion), and by pushing sound commercial development. Build a factory near your southern stations if materials movement is too slow and those houses aren't hatching. You must, of course, wait until your territory and budget can support pushing your frontiers.

LOOK AT YOUR REPORT CARD

It's time to start attending to profits, losses, and that eternal bugaboo, the bottom line. A-Train has a host of financial chartings and investment possibilities: let's look at your rail operation and maybe even manipulate some markets. The "fine print" of all these money managings and manglings can be found in the Money And Its Management chapter in the Reference section; we'll just look at the elementary aspects here.



The worst rail disaster in American history occurred at Nashville, Tennessee, on July 9, 1918, a head-on collision between two passenger trains that resulted in 101 deaths and 171 injuries.



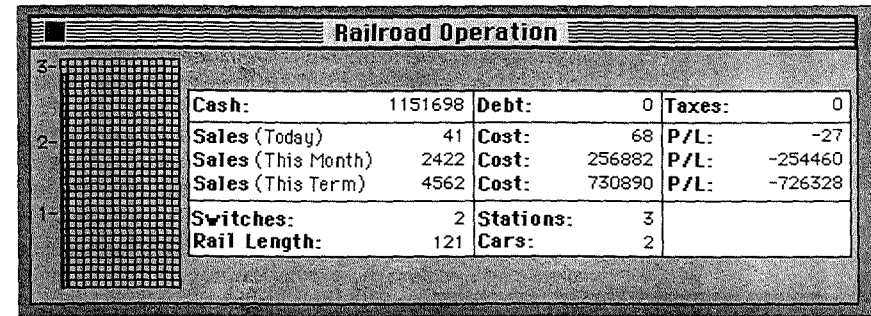
As mentioned before, it's nice—and useful—to know what the population of your city is and how rapidly it is growing before you even touch those nastier numbers. Click on GROWTH and you'll see a window that displays some city statistics, a graph of population change over time, and a "radar" chart that reveals the industrial

orientation of your city. The *Primary Business* is your rail operation, the *Secondary* is your city's main income subsidiaries (factories, buildings for rent), *Other Business* refers to things like amusement parks and hotels, and *Residence* is the ratio of your city area taken up by your residents.

It is wise policy to check the population tally frequently to determine the pulse of development. You can see how the erection of certain buildings affects residential numbers, and how much internal building by the simulation boosts these figures. Your city's successful expansion is how you "win" in A-Train, so keep fiddling with your properties and trains—go West (and East, North and South), young engineer.

THE RHYTHM OF THE RAILS

You can get a station-to-station "broadcast" of your railroad's fiscal health by clicking on the RAILROAD button, which brings up the RAILROAD OPERATION window. This report shows your cash on hand, your total debt and the estimated taxes (after March 31) for your company. The report's second level displays the constantly updated rail sales and subsidiaries income numbers for the day, the month and the fiscal term. The costs for these periods are calculated onscreen also, as well as the profit/loss figures for those times. These costs include initial train purchases and initial track laying costs, which can be quite dear.



This window also includes your station, switch, car and track length totals, as well as a graph showing your money (vertical axis) over time (horizontal axis). You will undoubtedly see a negative "spike"—the dreaded red—for your initial months, because of your operation's developmental costs. Naturally, you want to try to keep those money lines a healthy black color, but it's typical not to see a profit in your daily operation for some time.

The Mac Railroad Operation window can be closed by clicking in its Close Box, and also opened by selecting Show Train Sales Window from the Windows menu. The EXIT button is the standard means of departure for Amiga windows.



The Station Agent will make sure you take your shoes off and set a spell.

Balance Sheet			
Assets		Market Value	Property Tax
Railroad Assets:		996500	49825
Subsidiaries:	9	2989716	149485
Stocks:	0	0	0
Real Estate:	44	142000	7100
Total:		4128216	206410

Revenue		Expenditures	
Railroad Operation:	5435	Railroad Operation:	733056
Subsidiaries:	41448	Subsidiaries:	37670
Subsidiary Sales:	0	Subsidiary Purchase:	3096100
Stock Sales:	0	Stock Purchase:	0
Real Estate Sales:	0	Real Estate:	28200
Stock Dividends:	0	Commission:	0
Interest Income:	1151	Interest Paid:	0
Total:	48034	Total:	3895026
Profit/Loss:	-3846992	Income Tax:	100
Cash:	1152008	Total Tax:	206510

Exit the RAILROAD OPERATION window and click on the BALANCE button. This chart reflects your overall holdings: rail, subsidiaries, stocks, and real estate, and also provides you with the values of these properties and their associated taxes. There is a Revenue box for all these holdings that includes market dividends and taxes on all the incomes. Your expenditures for all your holdings, including commission paid on real estate deals and interest on your loans, are found in the Expenditures box.

There are two income tax figures, one the taxes on your assets, and the second the tax on your profits. Refer to the income tax information in the Money And Its Management chapter in the Reference section for the maneuverings to escape the pinch of those prongs. You should refer to this chart periodically to get a fix on the areas of weakness in your empire, to decide whether you should dump subsidiaries if they are unprofitable or buy them up to avoid heavy profit taxes, and in a general way to oversee your real estate investments. There is a more detailed breakdown of the Balance Sheet in the Money chapter.

Subsidiaries				
Cash:	1,151,759	Sales (This Term)	Profit (This Term)	Market Value
		2500	1821	268000
Golf Courses:	0 of 0			103600
Apartment:	6 of 6			
Dept. Stores:	0 of 0			
Amusement Parks:	0 of 0			
Lease Bldgs:	2 of 2			
Hotels:	0 of 0			
Stadiums:	0 of 0			
Ski Resorts:	0 of 0			

From this window you can buy and sell these assets. If you click on APARTMENTS and then on SELL (default on the Mac), you will see the statistics on the term sales, profit/loss and market value of all of your apartments, plus the commission you will gain for the sale. Click on one of the lines of information to select a particular property. The Amiga version has scrolling arrows to place the property within the centered highlight bar in order to sell it. Large-hearted benefactors that we are, we give YOU the realtor's commission.

The Mac version also allows you to look at the property in question by clicking on the VIEW button, which replaces the properties list with a close-up view of the selected subsidiary. Click VIEW again to return to the list. On the Amiga, the chosen property will blink on the map landscape.

Select one of your apartments and click on TRANSACT. You will see your cash figure rise and the ownership figures update. Selling and buying new subsidiaries increases population and employment opportunities, creating competition to propel development. The selling off of subsidiaries is also one of the game's best fund-raisers for quick cash infusions. (Note that the properties that were once yours no longer have the little box on their roofs after the transaction. This indicates that your company no longer owns them.) Exit the SUBSIDIARIES window.

Subsidiaries				
Cash:	1,151,759	Sales (This Term)	Profit (This Term)	Market Value
		2500	1821	268000
Golf Courses:	0 of 0			103600
Apartment:	6 of 6			
Dept. Stores:	0 of 0			
Amusement Parks:	0 of 0			
Lease Bldgs:	2 of 2			
Hotels:	0 of 0			
Stadiums:	0 of 0			
Ski Resorts:	0 of 0			

Subsidiaries				
Cash:	2,969,761	Sales (This Term)	Profit (This Term)	Market Value
		0	0	0
Factory:	1 of 1			0
Golf Course:	0 of 0			0
Apartment:	2 of 2			0
Commercial:	0 of 0			0
Amusement:	0 of 0			0
Lease Buildings:	1 of 1			0
Hotel:	0 of 0			0
Stadium:	0 of 0			0
Ski Resort:	0 of 0			0

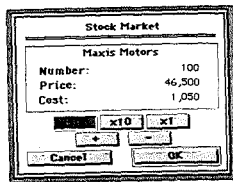
TAKING STOCK

You probably have a little spare time, since you're merely a CEO, engineer, property developer, and city planner—why not dabble in the market a bit? It's not necessary to do any stock trading to develop your city, but it is a means to diversify your holdings, give your income an occasional kick, and remind yourself of what a genius you are.

Click on STOCKS—open (and not ghosted on the Mac menu) only from 9-5—and you'll see a window with a securities advisor who will inform you about the current market conditions. Click him into fiscal limbo and you will see a graph charting the fortunes of a selected stock over the past 30 weeks, along with the stock board, which can be scrolled to display the 24 stock brands. The two numbers after the company name represent its trading value and the amount by which it has dropped or risen since the day before.

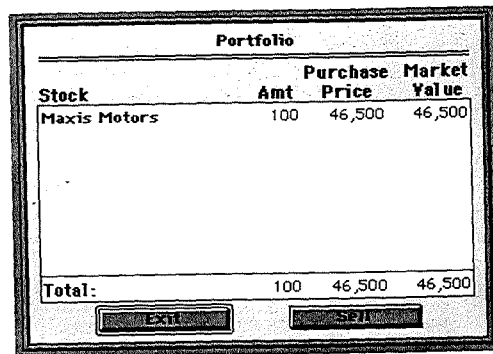
Stock Market			
Last 30 Weeks		Stocks Held:	0
		Cash:	1,151,759
Stock	Price/Share	Change	
Braun Construction	565	-1	
Heavy Water Chemicals	427	0	
Rezooff Lighting	496	-2	
Artlink Estates	472	-1	
Tesla Electric	477	0	
Slippery Stuff Chemical	555	0	
Sticky Disks	414	0	

When you click on any of the stocks (or on the Amiga, scroll a stock's name into the highlight bar), the graph will update to display that stock's trends. For now, search the board for a stock that seems to



have a fairly consistent rising trend, but that currently is in a flat or lull state. Click on BUY and you'll see a chart that identifies the stock, its price per total units chosen and the brokerage fee for the sale. You can increase or decrease your shares in units of 1, 10 or 100 by clicking on those buttons and using the plus or minus signs.

Buy 100 units of your selection. You can return to your train operation, but be sure to periodically check the board for your stock's performance. If it shoots the moon, sell, or if you have a canny touch, wait out your hunches (but don't say I didn't warn you). When you click on the PORTFOLIO (SELL on Amiga) button, your portfolio will appear, showing your stock type, shares, original purchase price and current market value. Click on the stock name and again on SELL and your cash total will reflect your market savvy.

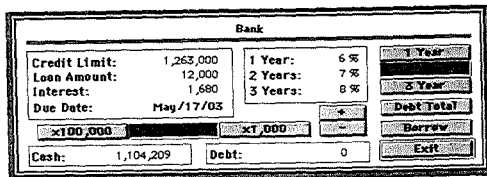


Be advised that slumps can occur where the value of some stocks will bottom out rapidly, no matter how well the rest of the economy is doing. Stay on top of your stocks; you can make some pretty coin this way, but you can also look like an absolute lunthead at nosedive time. Stock investment is also a good means to channel your profits when the taxman comes around. Check the Money chapter in the Reference section for specifics about stock types and investment. Exit the STOCKS window.

BANK ON IT

You might find that your visions of sugarplums will remain blurry unless you can do some developing right away, but every time you want to place a property or buy something nice, that sour old Accounting Officer pops up to tell you you can't afford it. There is a way to escape his tight fists: credit!

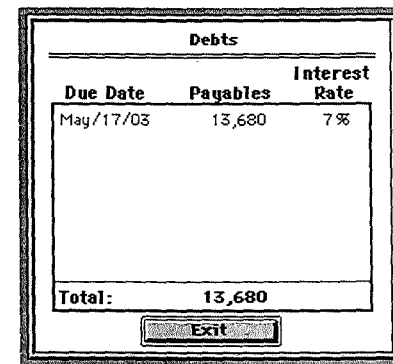
Go to the BANK command and click. You will see a window that reveals your credit limit and the current term rates from 1-3 years. Your limit is 30% of the company assets. You can adjust your loan amount by units of 1,000, 10,000 or 100,000 dollars by clicking on the plus or minus signs. Determine what amount



would satisfy you and click on BORROW. You will see the CASH figure tally your fresh funds.

Debts have an interest charge: the longer the term, the higher the interest. The management chief will warn you that your debt is due two weeks in advance. Debts are automatically deducted from your company funds on the appointed dates; you can go bankrupt if you don't have the cash on hand. Click on DEBT TOTAL to see your loan list and the repayment dates.

Be sure to shop for the best interest rates. If you plan to take out a sizable loan, these charges can kill you over time. But then again, living dangerously can be rather stimulating.



ALL QUESTIONS ANSWERED

The one button that we haven't discussed has a large question mark on it, and it's lucky for you you haven't clicked it, because it will cause your computer to erupt like Vesuvius. Just kidding—actually, it will bring up a Help window with representations of all of the game's icons and buttons, which, when clicked, will bring up Help text explaining their respective uses and functions. Click on all of them to get a pithy overview of what's what.



THE STRAIGHT SKINNY

Now you are armed with the whys and wherefores to make your mark on a map. However, these procedures are but a single scampering of your mouse across a room, barely looking at the furniture. The A-Train landscapes are fertile soil for many plantings—go dig in the Reference chapter for a while to get a sense of the program's depth, particularly the fiscal model, and then try to take over a territory. Or just jump right in and wing it. Each map has a thousand success stories waiting to happen. (Or a thousand bankrupt railroad owners, but hey, why be negative?)

The peak year for rail route mileage in the U.S. was 1916, with 254,000 miles of track; a 1976 survey calculated 211,000 miles, excluding municipal rapid transit lines.



Ordering Lunch on the Rails

"Give me a coupla battleships, a pan of Murphies on the main line, and a string of flats on the siding."

It was the waiter's turn to look mystified.

"Cut the cow car off the Java train," continued the boomer, "and switch me a coupla life preservers for a Consolidation. It's a long drag to the next feed tank, and you had better fill the auxiliary to its full capacity."

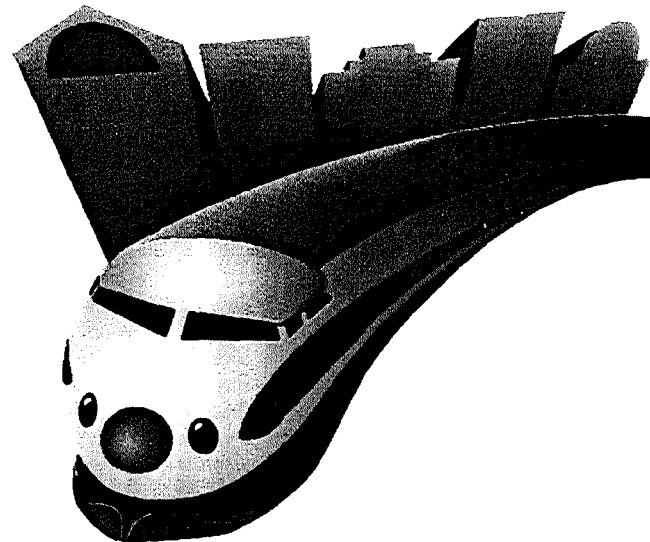
"Say," cried the biscuit shooter, "I've only been on here a week, and you left me behind at the last stop."

"Excuse me," returned the brakeman. "I thought you were an old head. Give me a couple pork chops, fried potatoes, and a side order of wheatcakes. Also a cup of black coffee and doughnuts. Fill the lunch basket, too, for it'll be some time before I get to the next restaurant. Put the coffee in the bottom and fill the upper deck with sandwiches and pie."

From Great American Folklore, compiled by Kemp P. Battle, Doubleday & Company, 1986.

A • T R A I N

Reference ▶▶▶



*Hear that lonesome whippoorwill,
He sounds too blue to fly.
The midnight train is whining low,
I'm so lonesome I could cry.*

— Hank Williams

REFERENCE

The following material will provide in-depth details about all aspects of the program, including specific situational strategies. Refer also to the Q&A chapter at the end of this section for answers to some broad overview questions and some detailed gameplay techniques.

THE BASICS

A-Train is a game that lets you wear several hats: you can simultaneously be a CEO, engineer, industrial magnate, city planner, stock market speculator and big-shot financier. And you have the opportunity to fail miserably or shoot the moon in all of these enterprises. Your goal, of course, is shrewd management of *all* of these linked components, which are constantly affected by the dynamic forces of the simulation, mimicking the roller coastering of forces in any developing landscape.

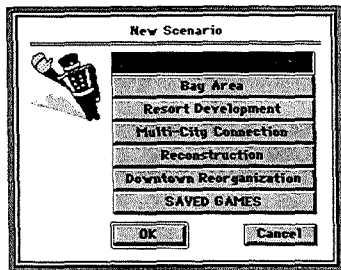
Developing landscapes are the shapeable clay of A-Train. You are given six different maps, all of which present varied, demanding challenges to contend with—but the basic issues are identical: How do you operate and expand a successful railroad? Where do you build factories, apartments, offices? When is the best time to sell them?

How do you balance out killing taxes and piling profits? What's a strategic approach to bank loans and the stock market? And of critical import, how do you manage the day-to-day (often hour-to-hour) details of *all* of these concerns, while asking your guardian angel to pull you up above it all to get a look at the big picture, and your company's future years down the line?

And you thought this was just a game.

"WINNING" THE GAME

If you reach \$50 million dollars in cash, you get the keys to the city *and* your favorite locomotive, and a chance to start all over again—your game is won. But the money measure is just one of many targets of game success to aim for. One significant notch on the ladder is the "upgrading" of the size of your city to the next notch on the city scale; see the Cities chapter for details. What you need to do is craftily develop your railroads and properties, jack up the population, and stack up some dough.



LOSING

Aside from winning, there is only one condition that stops the game play—if you go broke. If you don't have enough money to pay taxes or debts on the appointed dates (pay attention!), or if your cash resources dwindle to a nub at any time, the game is over. To avoid a game-over, secure enough money for your immediate taxes and debts by getting bank loans or by selling off the company assets.



No decisions about your offices and department stores are legit without the say-so of the Commercial Building Manager.

THE MAIN WINDOW

Most of A-Train takes place in the Main Window. The Mac window has a moveable "tool bar" and the Amiga a panel of buttons and icons at the bottom of the screen. Click on any of these choices to open various menus, windows and reports. Many of the Mac rail operation and property windows will automatically close if you open another window on top of them.

The Mac version lets you travel across the map via the scroll bars; the pressing or pressing and holding of the arrow keys on your Amiga keyboard moves the terrain in discrete or continuously scrolled small amounts. The Amiga cursor will also change to a small pointer at screen's edge, and you can then click or click and hold on the left mouse button to scroll the terrain in the pointer's direction. Clicking the Amiga's right mouse button will cause any open windows to



disappear, so that you are provided with more screen real estate to execute a command, or get an expanded view of your terrain without having to scroll or deactivate the command window.



Amiga Main Window

You might, for instance, have selected a site to build an amusement park, only to have the spot obscured by the AMUSEMENT PARK window. Click the right mouse button, place your park in the now-open terrain, and click the right button again to restore the command window. You can then close the window by hitting EXIT. The unshifted underline/minus key on your keyboard performs this same window-cleaning function.

The central part of the Main Window is a display of the current map. This is where you view your city, lay tracks, place train stations, and buy and sell land, buildings, businesses and resorts. The map is divided into squares, or "blocks." In this manual, distances are often given in blocks, i.e., "You should build an apartment no more than 10 blocks from a station."

There is a motor car on the Hudson Bay Line in Manitoba, Canada whose operator's sole function is to stop near any bodies of water close to the tracks and set out a beaver trap. Captured animals are thus prevented from building dams, which might plug a culvert and flood tracks, weaken roadbeds and even possibly wreck a train. The unharmed animal, Canada's national symbol, is then released to another stream or lake miles from the railway.



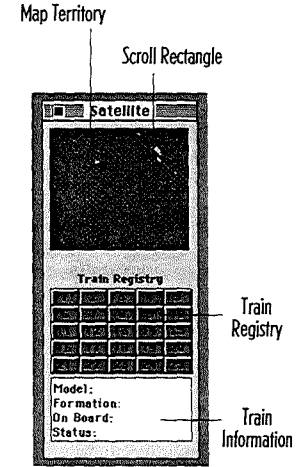
THE SATELLITE VIEW

One of the most useful views of your city is the SATELLITE view, which is accessed by clicking on the SATELLITE button. If the Mac Satellite window is sent behind the main window, it can be reactivated by clicking SATELLITE again.

The SATELLITE button opens up a small window with a small map of your total landscape. In the small map is a highlighted rectangle that delimits the area that is visible in the Main Window. Move the rectangle in the Satellite map with your mouse and click to quickly move to any place on the map. The Mac Satellite window can be moved around onscreen by dragging the Title Bar and closed by clicking in the Close Box.

At the bottom of the Satellite window or the bottom of your screen, there is a Train Registry for tracking the active trains in the current map. Each train is assigned a number from this chart. If no train is assigned to a number, it will be "ghosted" or greyed out.

When you click on the number of an assigned train, both the highlighted rectangle in the small map and the display area in the Main Window center on that train. Below the registry will be a display of the vital stats of the active train, including: train model, formation, current passenger total and operating status.



THE MAPS

There are six different maps you can develop, each of which consists of a mix of urban and rural landscapes and at least one operating rail line. It is a good idea to explore each landscape thoroughly; you'll need this working knowledge of your kingdom in order to rule over it with a deft touch.

MENUS

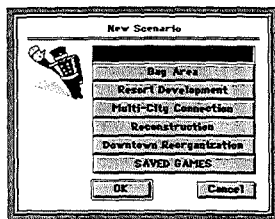
The A-Train interface provides you with either a floating Mac Toolbox of buttons and icon commands or an Amiga bottom-of-screen panel of command choices. Clicking on the buttons or icons will usually result in the opening of an onscreen window with various gameplay options. The Mac version also has a menu bar at the top of the screen to access many game overview functions.

Most windows stay open until you click on the Close Box or the EXIT button. Many menu choices open submenus or command windows. When a submenu is open, you can cancel a command by clicking the EXIT button. Many of the Mac EXIT buttons can be utilized by hitting the Return key.

George Westinghouse invented the airbrake in 1869. The innovation ended the days of individual car braking, which was highly ineffective and dangerous, and made him a fortune.



OPENING MENUS



After the credits for the game have been displayed, the NEW SCENARIO or GAME menu will open. When these menus are opened, the game clock stops. These menus consist of the following commands:

NEW SCENARIO MENU (MAC)

The Mac NEW SCENARIO window presents you with six landscape choices. Choosing one and clicking on OK brings up that chosen map, the command Toolbox and the Mac menu bar, from which you can choose many file and gameplay options. When A-Train is first loaded, clicking on the SAVED GAMES button in this window will access a Finder dialog box to load saved files.

MAC MAIN MENU BAR

Clicking on FILE brings up a submenu with command choices accessed by sliding the pointer to the command and releasing the mouse.

NEW SCENARIO brings up the aforementioned terrain choices menu brimming with rail magnate possibility. If you've mucked up a saved landscape, you can begin anew.

OPEN SCENARIO brings up a dialog box that allows you to search folders and other drives for saved games, which can be opened by the standard Mac Finder dialog box methods.

SAVE SCENARIO brings up a dialog box that allows you to save changes to the existing map or to rename and save the game. You have the option of saving to different folders on available drives, or canceling the procedures if you change your mind. Changes *will not* be saved if you quit the game without using this command.

PAGE SETUP brings up a dialog box that allows you to choose a number of printing options dependent upon your computer and printer.

PRINT MAP brings up the standard print dialog box, from which you can output eight labeled 8 1/2 x 11 black and white "tiles" that comprise the territory of your current map. Detail and crispness of resolution is printer dependent.

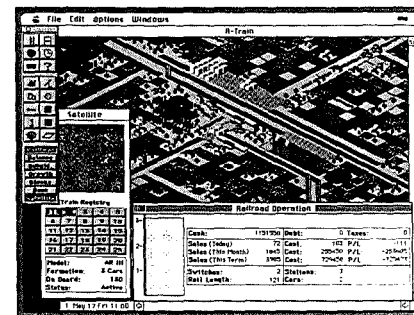
QUIT takes you out of your railroad barony and leaves you as just another schmo with a computer—why would you want to do it?

The EDIT menu has a host of ghosted commands that cannot affect A-Train gameplay, but that have been retained to support the standard Macintosh interface.

The OPTIONS menu allows you to choose the GAME SPEED command, bringing up a window in which you can set any of 11 game clock speeds by clicking on the scrolling arrows or dragging the scroll box.

From this menu you can also choose the PREFERENCES command, which presents you with a series of dialog box checkboxes that, when clicked, toggle the game's sound effects, music, and the day/night color changes that reflect time's march.

The WINDOWS menu gives you three onscreen windows that can be moved around by dragging their Title Bars and closed by clicking in their Close Boxes. Selecting the Show Main Tool Palette option brings up the Toolbox of icons and buttons to develop, regulate and assess your railroad and subsidiary operations.



Selecting Show Train Sales Window will display the RAILROAD OPERATION report, giving you a financial and physical overview of your train holdings. If any action hides this window, it can also be brought back onscreen by clicking the already highlighted RAILROAD button.

Selecting the Show Satellite View command will display your map's overview and Train Registry in the Satellite window. If obscured, it can also be brought back onscreen by clicking on the already highlighted SATELLITE button.

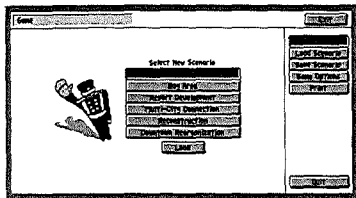
RAILROAD TALK

Cinder Dick—Railroad policeman or detective

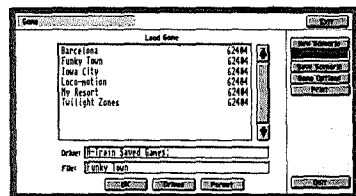
Coffee Pot—Small, old steam locomotive

Couldn't Pull A Sitting Hen Off Her Nest—Derogatory allusion to an inferior locomotive

GAME MENU (AMIGA)



The opening Amiga display presents a **SELECT NEW SCENARIO** tower of buttons that when individually clicked open up their respective landscapes—A-Train's six beginning maps. Just click on your map choice, then on **LOAD** to start a fresh game.



LOAD SCENARIO opens a requestor that presents the contents of the current drawer, allowing you to open any saved games by clicking on a file name and clicking **OK**. You can click on the **DRIVES** button to search on other disks and the **PARENT** button to move up a level to the drawer that contains the current drawer.

SAVE SCENARIO brings up a requestor similar to **LOAD SCENARIO**, allowing you to save map data to all available drawers and disks. The current file name can be changed in the File box and the **DRIVES** and **PARENT** button used to set the saved file's location. Click on **OK** to store the file. You must use this Save command to retain any game changes after opening a map—quitting A-Train does not save changes.

The **GAME OPTIONS** button gives you a chance to fine-tune some gameplay settings. The **GAME SPEED** command lets you adjust the clock speed of A-Train (relative to your computer's processing power) to 10 speed rates, set by clicking on the scroll arrows or clicking in the scroll bar.

The **PREFERENCES** buttons turn on and off the charming sounds of your train's motion, tuneful musical selections, and the waxing and waning of light and darkness through a day's passage. Clicking on the **SAVE** button after adjusting these settings will retain your choices for all games; clicking on **USE** will employ the new settings for the current game and cause newly opened games to revert to the original Preferences.

PRINT brings up a requestor that allows you to select paper size, orientation, page range and other printing options. See your Addendum for additional information.

QUIT will hijack your train empire and return you to blasé everyday life. Remember to use the **SAVE** command if you want to save game changes—quitting A-Train without saving will send your changes to oblivion.



The Track Layer will ensure the obtuseness of all your angles.

TRAIN COMMANDS

These are commands associated with the railroad construction operation, such as laying railroads and building stations. The game clock will stop when the submenu windows associated with the command's icons are opened.

TRACKS

Click on the little railroad tracks icon to lay or remove track using the **LAY** command and the **REMOVE** command. Costs associated with these operations will be displayed.

PLACE TRAIN

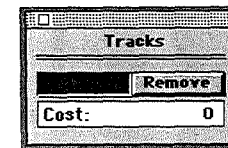
Clicking on the little train icon with the arrow gives you the commands to put a purchased train on a track or remove a train that was in operation (using the **PLACE**, **REMOVE**, and **TRAIN REGISTRY** commands). You can select a train number from the registry to see the display of the train's model, number of coaches and passenger total. The **STATUS** line will reveal if it's in operation, and if so, the map will center on the active train.

Open the **PLACE TRAIN** window. Next, use the Train Registry to select the number of the train that's to be put into service. Trains that are "in storage," i.e., not in service, can be returned to operation by selecting their number. Then click on the track where you want to place the train—it will appear there on the map.

Your train will have a set of arrows on its roof, one dark and one light, pointing in opposite directions. The train travels the direction of the light arrow. You can toggle the direction of train movement by clicking on the arrows.

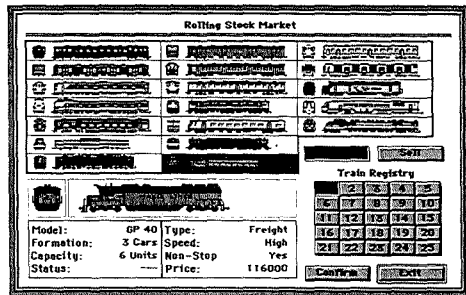
For already placed trains, the **PLACE** command in the Mac version will be replaced by **NEW DIR.** indicating that command option. Toggle the train's direction by clicking on its arrows.

To remove a train that is in operation, first click the **REMOVE** command. Next, select the train number. When the number is clicked, the map will scroll to display the train on the center of the map. Click on the train and it will be removed from the map, i.e., placed in storage. The train can be placed again, or if you choose, you can sell it in the Rolling Stock Market.



ROLLING STOCK MARKET

Lets you purchase or sell a train using the BUY, SELL and CONFIRM commands. To purchase a train, click the icon of the facing train, then choose an unhighlighted train number from the registry, and select a train. Click on CONFIRM to seal the purchase. On the Amiga, scroll to put the selected train in the highlighted central ribbon and click on TRANSACT—sold!



Only the trains that have been put in storage can be sold. To sell a stored train, choose the train number. The model, statistics and value of the stored train will be displayed after you click the train number. The train will be sold and its value added to your cash as soon as the CONFIRM command is clicked.

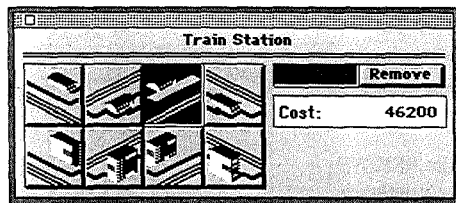
On the Amiga, choosing SELL, clicking on the train number and then on TRANSACT will sell the selected train.

TRAIN STATION

This command lets you build or remove stations using the BUILD and REMOVE commands.



To build a station, click the small sign icon, choose the station type, then click the place where you want to erect your station. The costs for this process will be displayed.

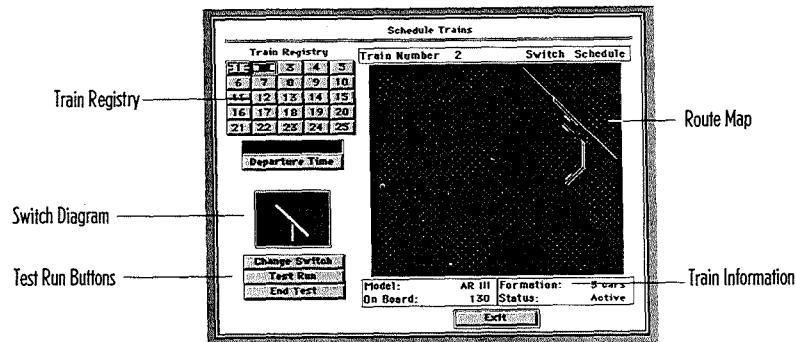


A station can only be built adjacent to track lying on a straight, diagonal line. You can't place your station near vertical, horizontal or curved track. Also, keep in mind that if you build a station on land that you don't already own, you will be charged for the land when you build. There is a fee for station removal as well.

To remove a station, click the REMOVE command and then click the station on the map. It will be replaced by cleared land.

SCHEDULE TRAINS

Use the Schedule Trains command to determine the stopping time, the departure time, and the routes for your trains. After you click on the small clock icon, a window opens that displays the Train Registry, along with a map showing all the rail lines, the train's information and some command choices. The selected train is displayed on the route map by a small highlighted square.



First, choose a train number. Then, choose SWITCH or DEPARTURE TIME. (It's possible to set both for each train from this window.)

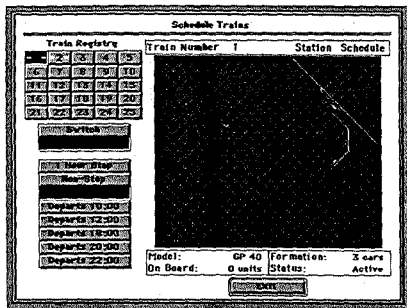
Set the SWITCH as follows:

Click on SWITCH. You'll see a small diagram displaying one of the switches for the train you've selected. The diagram is above the CHANGE SWITCH, TEST RUN and END TEST commands. Move the cursor on the route map so that the crosshairs shift to the nearest switch. Click to choose and highlight the switch. The small diagram will update to the current setting of the chosen switch.

When the CHANGE SWITCH command is clicked, the switch diagram will reflect the new direction that your train will assume at that switch.

Use the TEST RUN command to see a representational run of the new route. The train (dot) will keep running until END TEST is clicked. You can repeat the switch-changing commands to make the train run the desired route.



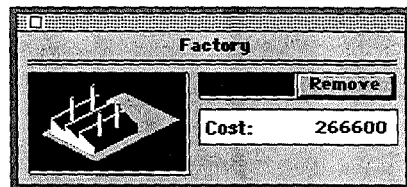


SUBSIDIARIES COMMANDS

These are commands associated with the building construction and real estate businesses. Using these commands, you can construct buildings on your purchased land or destroy or sell the buildings that are owned by your company. The Mac subsidiaries windows can be moved around onscreen; close them by clicking in the Close Box.

FACTORY

With this command you can build or remove factories that produce construction materials to speed your building or to augment the importation of incoming materials from the outside.

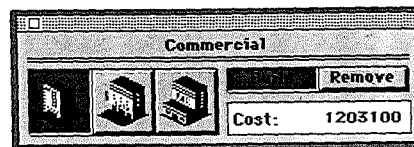


Click on the little factory icon and the FACTORY window will open. Clicking on BUILD will cause a highlight of the factory's outline to follow your mouse movement around the map. You can place the factory by clicking, as long as there are enough construction materials nearby and the site is feasible. The costs for building or removal will be displayed in the submenu window. You will be informed by a message window if there are any problems. Factories are good sources of employment for your population.

Choosing DEPARTURE TIME displays the window to set the departure schedules. Move the cross on the route map to the desired station and click—it will highlight as a box on the route map. Then click on one of the eight choices: choose either ONE-HOUR STOP, NON-STOP, or one of the six departure times. You must set the departure time for each train, so that each train has its own schedule.

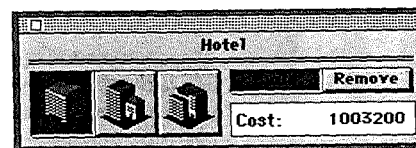
COMMERCIAL

These are enterprises like department stores and furniture stores. Use the BUILD and REMOVE commands to site your companies, but remember that it's cheaper to get it right the first time. Be sure to locate them close to your stations in the early going.



HOTEL

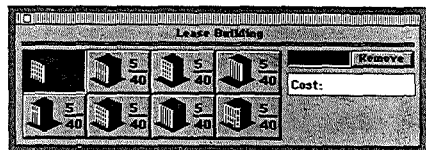
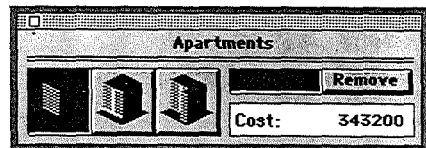
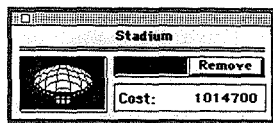
Don't place hotels until you have a population base. They can be solid sources of income in flourishing cities, particularly during those seasonal periods when recreational facilities are operating.



GOLF COURSE AMUSEMENT PARK SKI RESORT STADIUM

None will be profitable until your city has enough traffic to support them. They are all subject to seasonal income variation as well as influenced by their proximity to stations. They are expensive—build them with caution, with the long-term in mind.





APARTMENTS

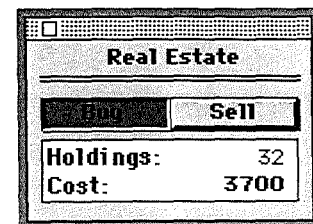
The placement of apartments at the early stages of the game is critical to city growth. The people who move into the apartments provide a labor force for local enterprise and passengers for your trains. You can place a number of apartments near your station and sell them fairly quickly, often at a profit, in order to produce funds to build more. The three building choices escalate in price from left to right, though their income and operating costs are the same. Do recognize that your apartment dwellers need places to work as well.

LEASE BUILDING

You can adjust the number of stories in units of five for each type of lease building by clicking on the various building icons. It takes time to finish constructing office buildings—you'll see a crane on top of the unfinished buildings that will disappear upon completion. The building can be opened for business only after the completion of construction.

REAL ESTATE

This command allows you to buy or sell land. When you click on the icon that looks like a skewed block of land, a submenu window opens, showing the BUY and SELL commands. You will see a figure that tallies the number of blocks that you own, and an expense figure for land purchase or income figure for land sale that will update as you move the mouse from block to block.



You can buy and sell (if company-owned) land where there are no subsidiary properties; you can purchase land with residences and small buildings, but it is more expensive than land without. Land owned by other companies—also available for your purchase—is surrounded by a dotted line.

HELP!

For you mystery lovers, we have provided one button with a large question mark on it. Click it and you shall see a Help window with representations of all of the game's icons and buttons, which, when clicked, bring up text screens explaining their respective uses and functions. Snappy pictures of game personalities spice up the display.



FINANCIAL AND REPORT WINDOWS AND COMMANDS

Click on their respective buttons to access these statistics windows. These windows display all your business reports and financial information. Some of the Mac windows can be moved around onscreen; close them by clicking in the Close Box.

RAILROAD OPERATION REPORT

This window lets you read the financial status of your railroad operations—there are no commands. The clock keeps going even when the window is opened. You can view currently updated daily, monthly and annual rail sales, debits, and profit and loss figures, along with info on the physical holdings of your rail empire.

Railroad Operation			
Cash:	1151690	Debt:	0
Sales (Today):	41	Cost:	68
Sales (This Month):	2422	Cost:	256882
Sales (This Term):	4562	Cost:	730690
Switches:	2	Stations:	3
Rail Length:	121	Cars:	2

BALANCE SHEET

This is an itemized report on the total assets and balances of the railroad branch, including real estate and stock investment. When the Balance Sheet is opened, the clock stops. This window doesn't contain any commands.

Balance Sheet			
Assets		Market Value	Property Tax
Railroad Assets:		996500	49825
Subsidiaries:	9	2989716	149485
Stocks:	0	0	0
Real Estate:	44	142000	7100
Total:		4128216	206410

Revenue		Expenditures	
Railroad Operation:	5435	Railroad Operation:	733056
Subsidiaries:	41448	Subsidiaries:	37670
Subsidiary Sales:	0	Subsidiary Purchase:	3096100
Stock Sales:	0	Stock Purchase:	0
Real Estate Sales:	0	Real Estate:	28200
Stock Dividends:	0	Commission:	0
Interest Income:	1151	Interest Paid:	0
Total:	48034	Total:	3895026
Profit/Loss:	-3845992	Income Tax:	100
Cash:	1153008	Total Tax:	206510

Assets

Properties and real estate owned by the company. The taxes for each category are also displayed.

Revenue

Company sales and incomes as well as the cumulative totals.

Expenditures

Company expenses are itemized, along with the yearly totals.

Taxes

All of your rail, real estate and subsidiary properties are taxed, as well as your profits.

SUBSIDIARIES REPORT

Use this window to buy or sell buildings and facilities. You can view income figures and current values for your holdings here. The clock stops when the window is opened.

The number of buildings and facilities owned by your company and the total number of buildings and facilities on the map are displayed. First, choose the building type. Choose the BUY command or the SELL command. A list of buildings available for purchase or sale will be shown. Move the cursor to choose the building and then click.

On the Mac, you can view the selected property by clicking on the VIEW button. On the Amiga, use the scroll arrows to select from multiple holdings of the same property type to center the selection in the highlight bar. The selected property will blink

Subsidiaries				
Cash:	2,769,761	Sales (This Term)	Profit (This Term)	Market Value
Factory	1 of 1			
Golf Course	0 of 0			
Apartment	2 of 2			
Commercial	0 of 0			
Amusement	0 of 0			
Lease Building	1 of 1	0	0	392,520
Hotel	0 of 0	0	0	354,750
Stadium	0 of 0			
Ski Resort	0 of 0			

Amiga Subsidiaries Window

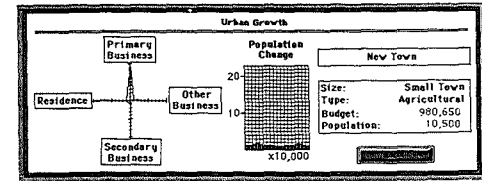
Subsidiaries				
Cash:	1,151,799	Sales (This Term)	Profit (This Term)	Market Value
Golf Courses:	0 of 0			
Apartment:	6 of 6			
Dept. Stores:	0 of 0			
Amusement Parks:	0 of 0			
Lease Bldgs:	2 of 2			
Hotels:	0 of 0			
Stadiums:	0 of 0			
Ski Resorts:	0 of 0			

on the map. Click on TRANSACT to seal the deal. Fees will be taken from cash assets for purchases; income from sales will be added to those assets.

URBAN GROWTH WINDOW

This window displays information on the town's character and environment. (You can regard the display map as a part of a larger administrative district.) The clock stops when the GROWTH window is opened.

Size reveals which of the following scales the city belongs to: a small town, a small city, a moderate city, a big city or a metropolitan area. One of the primary measures of A-Train success is the developmental upgrade of your city to the next scale, as defined by a combination of population and facilities development numbers. See the Cities section for details.

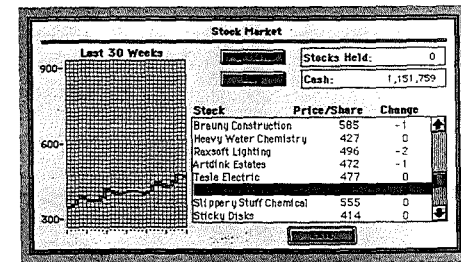


There are six Types of cities: agriculture-based, balanced, industrial-based, residential, tourist-based and underpopulated. The Budget is a measure of public investment; more funding results in faster city development. A growing Population figure results in more passengers and income for your railroad and faster simulation development. The "radar chart" graph displays the relative scope of your railroad operation, industrial and commercial development, and residential population of your city.

STOCK MARKET

This command lets you trade on the stock market. The business hours of the brokerage firm are 9AM-5PM, excepting Sundays and holidays. The STOCKS window can be opened only during business hours; the clock stops when the STOCKS window is opened.

To buy shares, click the up or down arrow to scroll the board that displays all the stock types. On the Amiga, scroll your selection into the central highlight bar. After you choose the company name, click the BUY command.



Another window will appear in which you can decide the share totals of stocks to be purchased by using +/- and the unit buttons, which

allow you to buy in increments of 1, 10, or 100. You are restricted to buying 2,000 units at any one time. There is a fee for purchasing stocks. To sell stocks, choose PORTFOLIO (on the Amiga, click on SELL), click on the stocks from the brand list, and click on SELL. Stocks are sold in the same unit totals as they are purchased.

BANK

Use this command window for borrowing money from banks. The business hours of the bank are 9AM-5PM, excepting Sundays and holidays. The window can be opened only during business hours; the game clock will stop.

Bank

Credit Limit: 1,263,000
 Loan Amount: 12,000
 Interest: 1,680
 Due Date: May/17/03

1 Year: 6%
 2 Years: 7%
 3 Years: 8%

x100,000 x1,000
 Cash: 1,104,209 Debt: 0

Debt Total
 Borrow
 Exit

The display will reveal your credit limit, adjustable loan amount, interest rates for the chosen term, and the due date for repayment. Current interest rates for the 1-3 year periods are displayed, as well as your available cash and updated liabilities.

Debt

Due Date	Payables	Interest Rate
May/17/03	13,680	7%

Total: 13,680

Exit

Choose a repayment period for the debt from 1-3 years. Adjust the loan amount using +/- and the unit buttons, which let you borrow in increments of 100,000, 10,000 and 1,000 dollars. After you click the BORROW command, the loan is added to your company funds. You cannot exceed the credit limit. The debt is paid automatically from the company funds on the appointed date; you can't pay the debt before that date.

To see all your individual loans, respective payment dates and debt total, click the DEBT TOTAL command.

SATELLITE

Clicking on SATELLITE brings up a window with an aerial overview of your map showing the layout of railroads and a train chart that provides the status of train operations for all your trains. The clock does not stop when the window is opened.

A rectangle enclosing the cursor on the reduced map shows the current territory of the larger display map. By moving the cursor on the reduced map and clicking, you can quickly move the display area to the cursor position. If you select a train number from the TRAIN REGISTRY, the display area will move so that the train is centered on the screen, and pertinent train info will be revealed.

Map Territory

Scroll Rectangle

Satellite

Train Registry

Train Information

Model:
 Formation:
 On Board:
 Status:

Map Territory

Scroll Rectangle

Amiga Satellite Window

Train Registry

Train Information

TRAINS: NOTES FOR NEW ENGINEERS

RAILROADS ON THE INITIAL MAP

The railroads on the initial map are part of your company assets. It is OK to integrate a new line with these railroads, to remove a station, or to build a new station. You will be given at least one passenger train and one freight train that are connected to places outside the map. They belong to the company, but their timetables can't be changed. They go straight at switches, and stop one hour at stations.

GETTING ON THE RIGHT TRACK

The most basic type of railroad is a single line between two stations. At the beginning, the line should be as straight and as short as possible, but long enough to be a reliable source of profit. Lay the track straight toward its destination. Stations should be built far away from each other (relative to the length of the line), because the fare you receive increases with the distance between stations. Make the distance at least 15 blocks.

A "belt line" is suitable for running several trains in the same direction. A belt line is a closed loop of track. Using a belt line, with its frequent, regulated scheduling, you can put many trains into operation at the same time. At the beginning of the game, you

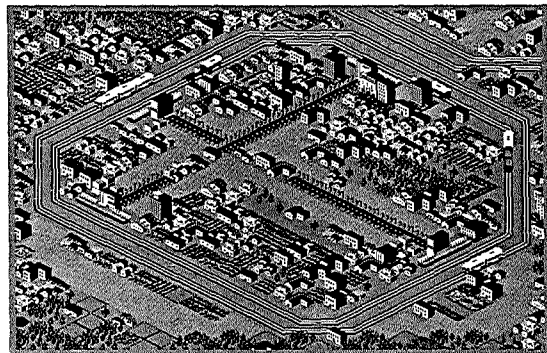
RAILROAD TALK

Fly Light—Miss a meal. A frequent condition of boomers and hoboes

Gay Cat—Tramp held in contempt by fellow vagrants because he is willing to work if a job comes along

Gods Of Iron—Huge, powerful steam locomotives

Large bull moose in Alaska that are traveling on the tracks will sometimes turn around, lower their antlers, and charge an oncoming train head-on. The meat is sometimes donated to local villages.



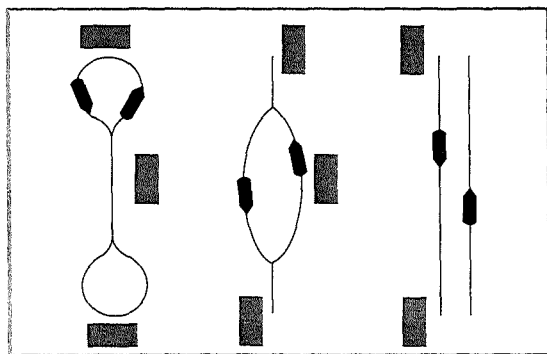
Belt Line

When shy of cash, play only on a single line. The shortcoming is that only one train can be put on the line, although it's conceivable to put a loop on each end of a developed single line so that several trains can be run at the same time. It's also possible to design a double line segment in the middle of the single line so that two trains can run in opposite directions, but it can be somewhat costly. The merit of a double-line railroad is that you can run passenger trains and freight trains on separated lines without conflict.



Train Station

Train



Some Track-Laying Possibilities

RAILROAD ENGINEERING

Laying a railroad is simple, but you should pay attention to your expenses. Just click on a block and move the cursor in the desired direction. A line of track will highlight and will be placed on the map when you click your mouse button.

Normally you can lay a railroad on any cleared land (except on a hill or on the ocean). You can't lay a railroad on land that you don't own or that isn't available for purchase; thus when track is placed, you've bought the land. When there are large facilities—lease buildings, parks, or roads—in the way, the track will have to be curved around them. Bridges will have to be constructed over rivers. If you start to lay some tracks and then change your mind, click the LAY command again or the Escape key or Spacebar to cancel the operation.

- Don't lay track any longer than necessary—the removal expense is 20 percent of the laying expense.
- You cannot destroy your company buildings to lay a railroad. But you may place tracks after the buildings have been removed through the REMOVE command in their respective subsidiaries command windows.
- When you want to lay a railroad on areas where other companies have facilities, it's necessary to buy the facilities and then remove them before proceeding. (They are not always available for purchase.) Keep in mind that costs for projects such as these are tremendous.

LINE-LAYING NO-NOS

In summary, a line can't be built if:

- 1) A railroad is connected to an established railroad by a right angle.
- 2) A railroad crosses over an established railroad.
- 3) A railroad intersects a river in an improper way—other than at a right angle.
- 4) A railroad passes through a public place, like a park.
- 5) A railroad passes through a company building.
- 6) A railroad passes through buildings owned by the other companies.
- 7) You lack construction funds.
- 8) You place your cursor outside the map boundaries.
- 9) Facilities such as skyscrapers, factories and amusement parks are in your path.

RAILROAD TALK

*Gone Fishing—Laid off
Grass Wagon—Tourist car.
Tourists like scenery
Hand Shoes—Gloves*



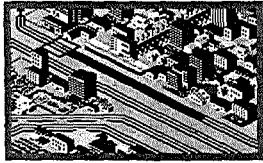
The Amusement Park Manager will keep you riding high.

CONNECTING RAILROADS TO EACH OTHER

Pay attention to the following issues when you connect one railroad to another:

- 1) When the railroads are connected end-to-end, you can't set a switch.
- 2) When a railroad is connected to the middle of an existing railroad, you can establish a switch.
- 3) You can't build a railroad that crosses over an existing railroad.

Note the angle between a planned railroad and an established railroad. You must lay track on a diagonal from existing track—you can't make two railroads connect to each other on a right angle. A track-laying advisor will pop up with a discouraging message when your planned railroad can't be connected to an existing railroad.



Track Highlighted for Removal

REMOVING A RAILROAD

To remove a railroad, choose REMOVE in the TRACKS window. Click the track's beginning point and follow the track to the desired removal point with the mouse. The line should be highlighted along its original path. Click the mouse button at your end point and the rail will be replaced with cleared land. Only the part overlapped by the highlighted line will be removed; any connected railroads traveling in different directions will remain. If there is a switch, only one line in a single direction is removed.

To remove a curved railroad, make the highlighted removal line match the curve of the tracks, or, if the highlight won't follow the track direction, separately remove the straight segments that constitute the curve. The cleared land is still owned by your company. If you're not interested in keeping the land, you can sell it by using the SELL command in the REAL ESTATE window. The cost of removing railroads is not affected by the land price.

TRACK EXPENSES

When you click the beginning point of a railroad and then move the cursor over different blocks, you might find that the number showing the construction expense in the TRACKS window varies. That figure represents the construction cost plus the purchase price of the land. Your construction expenses will be greatly increased if you choose to put in a switch.

When you are thinking of establishing a switch, consider the expense. An often-used line should be as straight as possible so that it's not necessary to make any directional change at switches, which can be expensive and impair efficiency.

- The railroad construction cost includes the track laying expenses and the purchase price of the land. The amount of money is dependent upon your route—long, curving tracks are obviously more costly. Some land may not be suitable for railroad construction, or may not be available for purchase.

Track Laying/Removing Expenses

	Laying	Removing
Rail	100	20
Switch	100	40
Bridge	0	1,000

Land Clearing Expenses

Wood	100
Farm/ranch	200
Residence	800
Public building	8,000

TRAIN REGISTRY FACTS

The TRAIN REGISTRY is found in the SATELLITE view, the PLACE TRAINS window, the ROLLING STOCK MARKET window and the SCHEDULE window. If a number is highlighted black, there is a train assigned to that number. If the number is ghosted, there ain't no train assigned.

The underline or the border of the purchased train number is the same color as the train after its placement on the map. When a train is put on a line, the train number is enclosed within a frame (the same color as the number's underline), indicating that the train is in operation. The model and the coach number of the train can be confirmed by checking the data column at the chart bottom.

Clicking on an existing train's number brings up that train on the map. If you have just placed a train, it will start moving as soon as the menu is closed and the clock starts.

Women were given their first employment opportunities as engineers in 1974 on a Texas line.

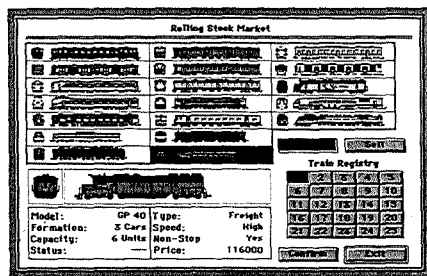


Train Registry																								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Model:										AR III														
Formation:										3 Cars														
On Board:										10														
Status:										Active														

All work such as placing/removing, buying/selling and adjusting timetables of trains is done based on the train number. The same number can't be assigned to more than one train. You can assign trains their numbers in any order, whatever your preference.

FIRST-TIME TRAIN BUYERS

To purchase a train, click on the small facing train icon, then choose a train number from the TRAIN REGISTRY. It's easy to recognize a registered train—the train number border is highlighted or colored. To buy a train, click a number that is free of these distinctions.



Click on any train image in the train list on the top of the window. On the Amiga, use the scrolling arrow to center a selected train in the highlight bar. Detailed information on the selected train will be displayed below the list or in the highlight bar. There are two types of trains: passenger trains and freight trains. There are 15 models of passenger trains and 4 models of freights. The high-speed trains move three blocks per hour and the low-speed trains two blocks per hour. After clicking the CONFIRM or TRANSACT command, your train will be registered on the display by its underlined or colored number. The train will be put in storage and won't be put into operation until it is placed.

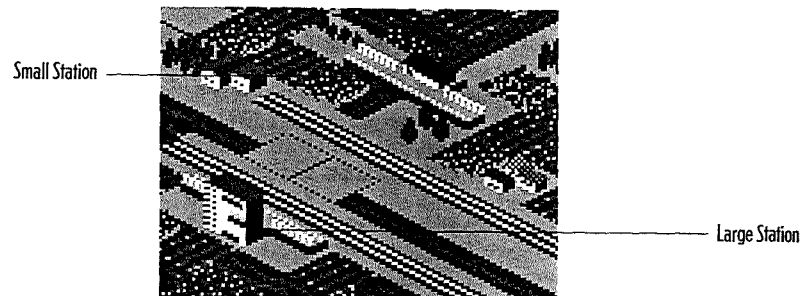
Only the trains that have been put in storage can be sold. To sell a train, click the SELL command. Next, choose the train number. On the Mac, choose the number first and confirm that SELL is highlighted. The model and statistics of the stored train will be displayed after you click the train number. The train will be sold as soon as you click the CONFIRM or TRANSACT command.

- You are limited to ownership of 25 trains, whether they are in storage or in operation; you can sell any of those in storage. The sale price is half that of the purchase price.

Note: AR III trains are a sound choice for a passenger train. They are a little expensive, but the investment can pay off.

SMALL AND LARGE STATIONS

There are two types of stations, a solitary station and a station with large buildings attached. The former is called a small station, and the latter a large station.



Choose your place to build the station according to your budget. Each map begins with one or more initial stations; a typical approach would be to lay a railroad from the initial station to a terminal station at the site of your choice (remembering that track laying isn't cheap, of course). However, this might mean integrating your new trains with the existing train's schedules, which can be a challenge. You can also lay independent lines near your initial station that will still collect passengers and freight without being connected to the original line. Your track must be within two blocks of the original station platform to pick up passengers, though you can build a new station near local development to share traffic.

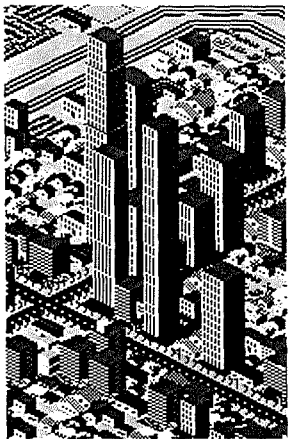


The Stadium Manager will provide wise counsel concerning unruly crowds.

You can also site the station first and then lay a railroad to the new station. Of course, all construction decisions should be made to promote the future development of the city. Building a spate of stations early in the game before there are a lot of passengers might imperil your cash flow, your income and (shudder) your future.

Both small and large stations are used for the boarding and departure of passengers, but they differ in construction expense, income and their effect on the city development.

The construction charge is 120,000 dollars to build a large station, three times that of a small station. Both also require the initial purchase price of three blocks of land. To remove a large station, it takes 12,000 dollars, again three times that of a small station removal.



The most important difference between the two types of stations is how they affect the city development. It is much easier to develop a large city by building large stations. The large stations can handle bigger passenger totals, whose movement is an agent in game development. The simulation will not build a large, centralized road from your station—around which development flourishes—unless there is a large station with plentiful passenger totals.

Smaller, residential areas will be built around the smaller stations, with consequently fewer and smaller buildings built by the program. If you want to develop a big city, it's better to build a large station at the beginning of the game, provided there's no financial problem.

You need at least three blocks of land to build a station, plus a number of blocks for materials storage. It is wise to reserve some land for laying another line in the future that will utilize that station, and advisable to build your station in a place where no nearby hills or seas would hinder city development.

You can use construction materials from any place on the map to build the station (as long as your company owns them), but you must provide a place for storing materials around the station for future construction by purchasing nearby land. If there are no available materials on the map, you can't build your station.

STATION STOPS

A train stops at a station when the head coach of the train arrives at the middle of the platform. If the line is not parallel to the platform, e.g., the line turns at a switch, trains will not stop at the station.

Two separate lines of trains up to two blocks (track distance) away can make station stops. Trains on lines passing at the back of the station cannot stop at the station. The train on the left line has priority to stop at the station over the train on the right line if the two trains have the same distance remaining to the station stop. When both trains are far away from the station, the train closer to the station has the priority. A mix of freight and passenger trains can use a single station.

- It's possible to build a station in a place where no railroad lines are in operation. You will be charged for station construction expenses, but the building will not function as a station until a line is laid. They make rather expensive ornaments.



"I saw also the Lord sitting upon a throne, high and lifted up, and his train filled the temple."

— Isaiah 6:1–2

THE END OF THE LINE

Train length is important in relation to where tracks end at the station. Track ending at the middle of the station is suitable for two-coach trains, but not for three-coach trains. This is because the three-coach trains cannot stop at any station where tracks do not extend to the end of platforms.

If the tracks at the station aren't the correct length, the construction materials will not be unloaded, or the materials which have just been unloaded will be loaded again and carried away.

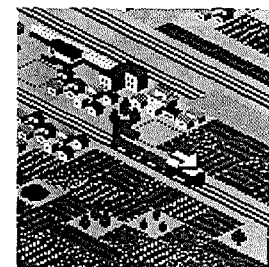
When one of your trains reaches the end of the track, it will cleverly reverse its direction and set off back up the line. The direction of an operating train can be changed by choosing the train number via the PLACE TRAIN command (which gives you the NEW DIR. choice on the Mac) and then clicking on its directional arrows. For trains that run on the wrong route, it's better to remove them and then rearrange them.

When two trains have a possibility of colliding head-on, you'll probably have a traffic jam on your hands. The two trains will stop moving before they collide, gently stopping end-to-end. To prevent such occurrences, change the direction of a train or remove one train using the PLACE TRAIN command.

When a train is removed from the line, the building materials on the train will disappear, but the passengers will go home—the population will not decrease.

If a freight train is placed directly at the station, it will depart without loading materials. Place it just out of and toward the station if you want it to pick up freight.

- It is all right to put a train on any area of the track. But you can't put a train on a line that is shorter than the length of the train. (Not that it would provide a dazzling scenic excursion anyway.)
- If your designated placement isn't displayed on the map, use the scroll arrows or the Satellite view to scroll the map.



The Apartment Administrator will keep an eye on the soap and towels.

The Florida East Coast (FEC) railway operated an overseas extension—37 miles of track over the water—between the mainland and Key West between 1913 and 1935 until hurricane damage put it out of business.



TRAINS AND THEIR CARGOES

Trains are divided into two main types: passenger trains and freight trains.

Passengers board and disembark when a passenger train stops at a station. The more buildings there are around the station, the more passengers. However, the total of station passengers near facilities like amusement parks or ski resorts varies with the seasons. The fare is based on train type and the distance between the stations: longer distance, more dough. Train operating expenses vary by train type and passenger totals.

Passenger totals will often exceed the train capacity because they reflect the common practice of cramming cars full of people at rush hour. Don't worry, there's never been a fatality in A-Train. The stated capacity figure in the Rolling Stock Market is intended to represent the suggested multi-car capacity.

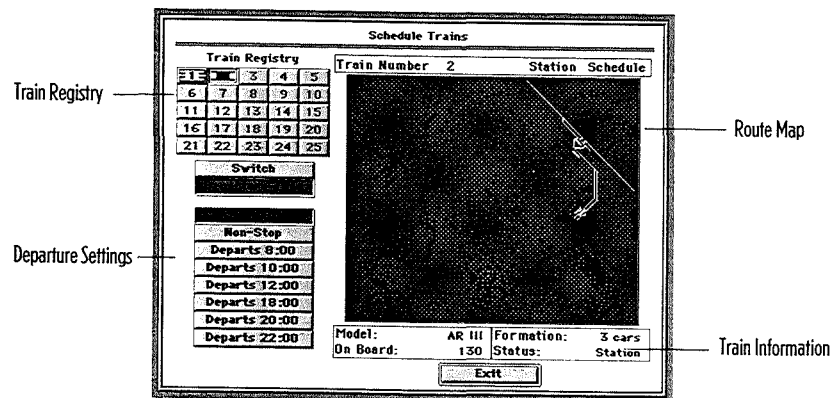
Freight trains are used to transport the construction materials from which all buildings are made. At the beginning of the game there will be at least one original place to store the materials on each map; you must buy the land for this storage for additional stations. Freight trains transport the construction materials from the storage place to the first station stop. If there are construction materials deposited at a station, any empty freight trains will pick up and transport the materials to the next station stop.

- Construction materials are also produced by the factories on the map. If the company has a storage place near the factory, the materials are piled up there by way of your freight. If there is no station nearby, the materials can't be carried away to build elsewhere. Obviously this makes it a good idea to build factories near the station, or to build a station near the factories. See the Cities section for details on materials movement.

SCHEDULING SHENANIGANS

The trial-and-error method will instruct you in the most profitable means of running your railroads for the specific conditions of each map. Each train's operation is controlled by setting its switches and departure times. You'll be charged 10 dollars per setting. The income of a train depends greatly upon its departure scheduling. A departure time of 8:00AM is very efficient: you can make the train depart at 8:00AM in the residential areas and at 6:00PM (18:00) in the office

districts so passenger load is maximized. Belt lines require more closely scheduled stops so that multiple trains can "play tag" at a succession of station stops.

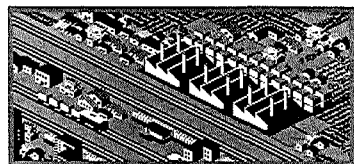


However, if you're running trains on single lines into areas that seem to be of equal growth or building type, e.g., both residential with a similar population, you can set the schedule at 8:00AM at *both* stations, so that the train is on a 24-hour "loop" service.

The train would leave one station on Sunday at 8:00AM and go to the other station, where it would wait until Monday at 8:00AM to depart. The success of this venture is dependent on variables like distance between stations, speeds of trains, and game speed setting: you might not be able to make the distance between stations in the 24-hour frame if conditions aren't right.

Frequently checking the passenger totals in the Satellite view will give you a sense of what times are most favorable for filling your cars. Once your lines are established, be sure to check periodically in the Railroad Operation report to see if you are getting closer to turning a profit—be warned that it can take considerable time. Remove the freight trains from the tracks when you have a big materials buildup. They drain operating expenses when they're running.

All switches are set initially so that the train moves on a straight course; the departure times are set for one-hour layovers. To run



RAILROAD TALK

*Jawbone Shack—Switch shanty.
People chatter there*

*Join The Birds—Jump from a
moving engine or car, usually
when a wreck is imminent*

*Knowledge Box—Yardmaster's
office; president of the road*



*The Accounting Officer
will pinch your pennies
until they squeal.*

trains efficiently, exercise care regarding the distance in blocks between two stations. A long-distance excursion is more profitable than a short one.

Note that it is this block distance that affects the fare, not the length of the track between the two stations. However, in the beginning, it's good economics not to build stations a great distance—30 or 40 blocks or more—from each other because of track laying and operating expenses. They also can be so far away that you can't effectively use a 24-hour schedule. You can remove short-distance stations further along in the game when you're flush with cash.

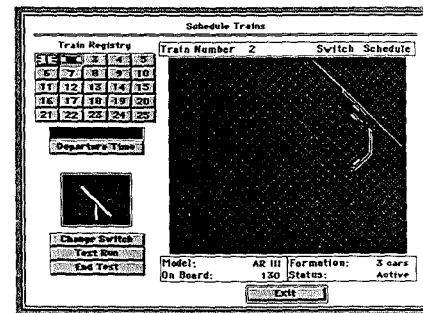
When the income from a station is small, let the trains have a long layover at the station so that the fuel costs can be economized and more passengers can be carried at one time. Conscientious scheduling of freight trains might become necessary to insightfully control the amount of construction materials at a station, though they can often run simply on the one-hour stop schedule. Don't forget that personnel fees are charged when loading and unloading materials, though the freight can earn up to \$28 for each transported material.

When a train runs on a single line, a schedule is not absolutely necessary, though setting one can greatly increase income. When two trains run on a single line, schedule station departure and layover times so that trains can lead or follow each other without trouble.

SCHEDULE WINDOW SPECIFICS

- When several trains need scheduling for a specified switch or a station, you can easily schedule them in succession by choosing the switch or station and then their respective numbers, setting the departure time and then going on to the next train, without needing to leave the Schedule window or return to the game map. You can schedule trains in any order of their Train Registry numbers; you don't have to follow the 1–25 chart sequence.
- Since the train number is used to control the switch setting, trains coming from the same direction on the same line can be made to diverge in different directions. It's also possible to let trains that move on different lines stop at the same station by using the switch setting.

- The execution of the TEST RUN command doesn't change the current position of the train. The new direction for a switch setting is easily confirmed by looking at the actual map. A train approaching the switch goes in the direction the switch is set. The branch direction of a switch is set only for the chosen train—to have all trains turn in the same direction, it's necessary to individually set all train numbers.
- When ONE-HOUR STOP is chosen, the train departs by itself an hour after it arrives at the station. During the layover, passengers get on and off the train and goods are loaded and unloaded.
- When NON-STOP is chosen, the train will pass by the station. NON-STOP can't be chosen for a train that is not permitted to pass by a station, as is the case for a number of train types. You can verify the type in the Train Catalog chapter at the end of the Reference section.
- When a departure time is chosen, the train stops at the station until that time. Multiple trains cannot be set to depart at the same time if there is only one line. (However, with careful staggering of train placement, multiple trains on a belt line can be set to the same schedule.)



CITIES: MAPS, MATERIALS AND DEVELOPMENT

SCENARIOS AND STRATEGIES

Here are the map numbers and the type of challenge each represents. There are six maps that have varying geographic features and degrees of development. It is easier to get familiar with the relationships between railroad operation and town development using a map with a smaller number. Naturally, all of the counsel offered here constitutes merely one particular slant to interpreting the maps. This is one of A-Train's beauties: there are many fuels for the engine of commerce—experiment with the mixtures!



*The Construction Manager
will keep your buildings
from tilting.*

MAP NAMES AND FACES

- #1. New Town
- #2. Bay Area
- #3. Resort Development
- #4. Multi-City Connection
- #5. Reconstruction
- #6. Downtown Reorganization

There are also six basic types of cities: an agriculturally oriented city, an industrial city, a "balanced" city, a residential city, a tourist-oriented city and an "underpopulated" city. Plan your development or try some free-form experimentation to move from one type to another.

There are five city scales; your map's current scale can be read in the URBAN GROWTH window under "Size." They are Small Town, Small City, Medium City, Big City, and Metropolis. These scales are determined by the simulation, which assigns a point total to a combination of building types and building totals plus the population figures. A block of public buildings counts one point, and a block of lease buildings two points (each five floors of a lease building is counted as one block). The point figure is not available in any reports; it is calculated and constantly updated by the simulation. If you have that kind of a personality, you can count 'em on your own.

Broad development of your subsidiaries holdings and related expansion by the simulation should eventually boost you to the next scale, which is one of the signal benchmarks of A-Train success.

The Small Town population is usually under 24,000; the Small City, from 24,000 to 64,000; the Medium City, from 64,000 to 88,000; the Big City, from 88,000 to 150,000; and the Metropolis, 150,000+. If you reach the population figures without a scale upgrade, you need to build more and larger property holdings, such as the large lease buildings. The Bullet Train (Shinkansen) will run through middle-sized or bigger cities when the population and building point totals have been attained.

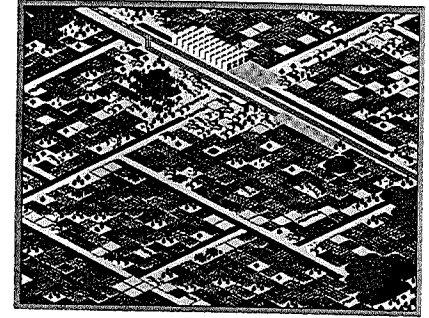


I shall never travel without my diary. One should always have something sensational to read in the train.

— Oscar Wilde

New Town

Map One has the most basic geography. Besides an old railroad line and a station, there are only small residences and ranches. This "new town" is in the suburbs of a big city off the map, and its population needs increase. It can be built up as a "bedroom" community when it has a good transportation network. One problem is that there are no facilities (such as department stores and lease buildings) in the town. You can build practically anything, but to do well isn't so easy.



Map 1

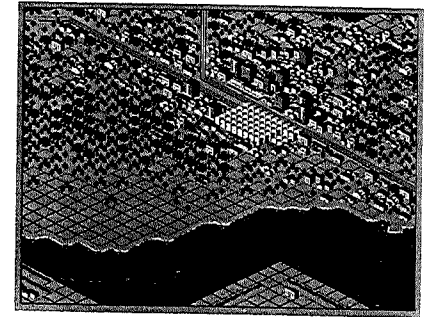
You should *absolutely* master the technique of how to lay a profitable line. The simplest way to do so is pick a nice site, lay straight double lines, and buy two AR III trains. Build the large stations at each end of the lines, and set all the departure times for 8:00AM.

After finishing the train scheduling, wait to see changes ensue. You'll find that the number of passengers increases to about 100. If you build two to three apartment houses around the station, passenger numbers will increase more rapidly. The key points are buying the AR IIIs and setting that old 8:00AM departure time—and logical development thereafter.

Bay Area

Map Two isn't so difficult if you've mastered the basic technique of laying profitable lines. There is already a large population. Rapid development could be stimulated by active, broad expansion of the railroad company and its holdings.

The problem here is how to effectively use the old railroad line at the top of the map and how to transport the materials to develop the bay area at the bottom of the map. (The harbor is used as a site to store the materials unloaded from ships at the end of the reclaimed land; the ship is the *Bonhomme Richard*.) Doing nothing with the old line will land you a deficit because of the expenditures you face in leaving it unattended. To avoid the deficit, just apply the basic techniques:



Map 2

RAILROAD TALK

*Last Call, Last Terminal—Death
Lizard Scorcher—Cook
Louse Cage—Caboose*

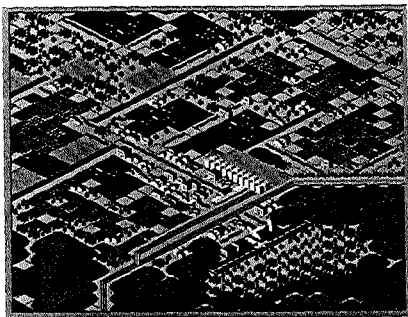
First, check the freight train near the factories on the upper-right part of the map. If there are only small amounts of materials to be transported, remove it from the line for a while.

Next, check the second train to see if the departure time is 8:00AM. Reset it if necessary. If passenger load increases to more than 1,000 passengers, it's also OK to set the departure time at 6:00PM. You can also change the trains on the line into AR IIIs to spank some profits.

Of course, experimentation is always fun. Try to make an industrial strip near the harbor. Bring the people amusement parks and hotels, and bread and circuses a little further away. Be the master mogul of the map.

Resort Development

There is nothing here in Map Three except the rich natural surroundings. Don't worry too much about the airport in the bottom-right corner of the map. (If you're interested, the airplane is a DC-10.) Like Map One, this map is wide open, but you haven't much cash. Don't rush into development, or your company will go bankrupt soon. Because the old railroad line is very short and the materials-storage place is too easily filled with materials, the first recommendation is to extend the materials-storage place to keep more materials.



Map 3

Next, make your lines profitable. Buy AR IIIs and lay a railroad that can be expanded into double lines in the future. The departure time is, of course, set at 8:00AM. After making some money, set up a double-line railroad.

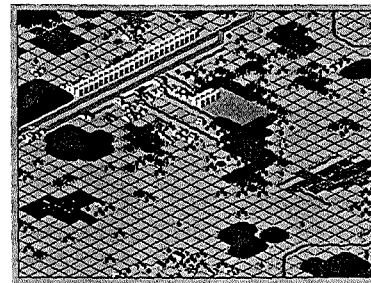
Choose a good site, and concentrate on its development. Don't forget that the best use of your money for this map is for resort development. Sculpt your city around the mountains and lakes to build a handsome, livable environment. Taking out some bank loans is one way to make quick cash. Try to work with one-year debts. From this map, you can learn the loan and payback process. Rising development will draw the population from outside the map. Keep in mind that the population will not increase suddenly.

Multi-City Connection

Map Four looks quite similar to Map One, but they are different. When you have a look at the URBAN GROWTH window, you'll find that the scales of the industry and residences are very small. Besides, there's no cash.

The first thing to do is to borrow money for laying railroads. Make as many three-year debts as possible. It's very important to concentrate on industrial development. Don't build commercial yet, but construct a factory in a proper place, and lay a short railroad with an AR III locomotive that serves it.

Now it's time to encourage residential growth. Since there is little, pay attention to the whole balance: number of work sites, other buildings, etc. that develop the residential population.



Map 4

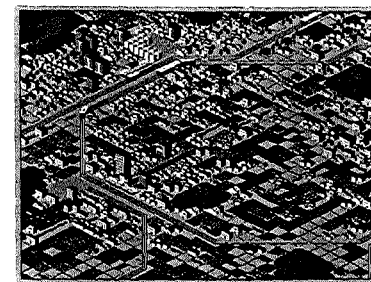
If the program is slow in building residences, sell the factory, even if at a loss, and build another factory. You can also sell the new factory and build only apartments. When the city has been developed to some scale, apply the techniques of profitable railroad operation to develop the land in front of the station. If everything goes smoothly, enlarge your apartment holdings to make some rental cash. To avoid a high profit tax, you can invest in trains. Don't forget that you'll have to pay back any debts.

It's a good idea to connect the scattered cities and villages by railroads to stimulate growth. Focus on expanding types of businesses. But keep in mind that a rash of thoughtless development may bring a state of chaos to the local business community.

Reconstruction

Although Map Five already has an advanced city, its progress will stop if the transportation network lags behind the development. The railroad is now on a belt line, but it's running at a big deficit. Your company will go bankrupt if no action is taken. The first task is to reconstruct the railroad to reduce the deficit. Your expenses are now twice your income, and lack of cash is a big concern.

To cut down on expenses, get in there and manage that railroad. Check the schedules. You'll find all trains have been set to one-hour stops. Reset the departure time of each train to 8:00AM. You'll want to buy the AR III engines (not that we're trying to suggest anything), but cash flow is nil.



Map 5

What to do? Determine if there are any freight trains that aren't doing a bang-up job. (Hint: You'll find there's such a culprit at the bottom-right corner of the map. Remove that train immediately.) By doing so, you'll find that your expenses and income begin to equalize, although there might still be a small deficit. From this point the real game starts.

Take out some loans and build apartment complexes. When you observe that the whole city is thriving, buy some good land and sell it soon after. Cash will increase, and so will the population.

When you're flush with funds, change all the trains into AR IIIs step-by-step. After only AR IIIs are on your lines, your railroad operation should become profitable. The next stage would be to develop the area around the lake. People will leave the city if they have no alternative. Keep a balance between costs and progressive construction to invigorate the city.

Downtown Reorganization

Map Six already has a fairly developed city. There are a lot of buildings, and the business is active. There isn't a lot of cash on hand, but you can coax its increase. Your belt line is profitable and the city is already on a large scale.

Where's the challenge? As time passes, you might see the industrial center deviating from the city center. Traffic jams—like a chronic disease in the transportation network—might appear. It's necessary to reconstruct the transportation network in order to keep the city active. Here you should carefully study the map and fine-tune the situations. Learn how to make a steadily profitable belt line. Develop the area in front of each station.

Be playful: you might try repositioning a number of stations, try different types of recreational facilities, new track sidelines... enjoy your prosperity or create dangerous financial threats—it's all yours.

DISTRICT DEVELOPMENT

The basic process of city development can be illustrated as follows:

At the beginning of the game, you lay railroads, build a station and provide materials-storage places. Dependent on variable conditions, some residences may appear around the new station, but there will be few passengers for your startup rail operation.

Then you construct apartments near the station to increase residents. The program will gradually respond by building residences, providing more passengers for the railroad. Repeat the procedure of purchasing and selling off lands to increase this building of lots and residences.

You can directly construct the subsidiary companies of your railroad operation. Their purpose is to produce profits. (Commie insurgents are found off the maps.) Facilities around the station also lead to the development of the city. Choose the optimum sites to construct facilities that will produce the most profits. There is a list of building expenses for all properties—that includes advice for their utilization—at the end of this Cities chapter.

MAKING HAY WHILE THE SUN SHINES

The initial conditions vary with each map. It is to your advantage to learn the details of company capital and property and to examine the weak points of the company management.

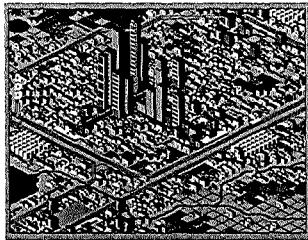
The debt limit, as well as your expenses and your tax owed, depends on the company assets. Study and confirm operating train incomes on the map, and pay attention to the town population and to the fluctuations of stock prices to find opportunities for growth.

On each map, there are lines connected to the outside areas. These lines play an important part in transporting construction materials from outside. At the beginning, schedule the train run once a day (for those trains that you can schedule), and increase the number of runs as the town grows.

INDUSTRIES DEPEND ON YOUR INDUSTRY

If the population doesn't increase naturally any more, you have to create employment opportunities. You can build factories, department stores, etc. Stunted population growth is rare, but sometimes it may happen.

The balance between supply and demand of the labor force has a great effect on the economy of the city. For example, if there is a surplus of labor force, factories will increase production, and consequently so will the incomes of other subsidiary companies increase. But the construction of new residences slows down. You should keep a sufficient labor force—by building apartments and work sites to stimulate the program's building—to ensure the development of the city.



Map 6

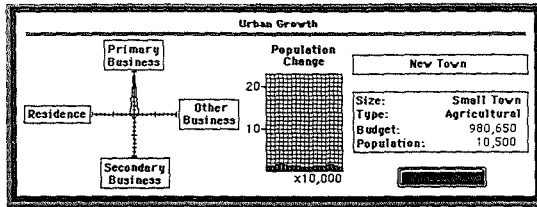


*Master Maniac—The master mechanic
Mud Chicken—Surveyor
Nut Splitter—Machinist*

Besides working, the residents carry on with their daily lives. Some play golf and ski on holidays; some hang out on seedy street corners. The recreation facilities provide places for their leisure and their work.

Secondary Business

You can check the concentrations of your city's industrial economy in the "radar chart" scale in the URBAN GROWTH window. By Secondary Business, we mean the fundamental infrastructure of the city, as opposed to your primary industry, the railroad. Factories and lease buildings are the basic elements of the secondary industry. The income of a lease building depends upon the number of tenants. The companies using the building will provide employment opportunities for your residents.



Other Business

The elements of the Other Business consist of golf courses, amusement parks, ski resorts, stadiums and hotels. The income of each depends on its location. Don't construct two large-scale facilities of the same type near each other.

Different facilities can be built in each neighborhood. It's better to build hotels near recreation facilities. When you have a substantial level of development and ready cash, build each of the four leisure-type facilities and several hotels around a station. The entrance fees for the recreational facilities and the incomes of the hotels will symbiotically boost profits.

At optimal sites, other companies will attempt to do the same business. In order to avoid competition, it is better to buy all the land around the station early in the game. Competition can spur development, however.

Besides being a source of profits, these commercial developments supply the ornamentation for a colorful, scenic map as well—one vote for style.

EFFECTS OF SPECIAL BUILDINGS

Certain businesses produce high concentrations of people, which can increase the passenger totals of the station nearby.

At the end of a year, customers of department stores (commercial buildings) greatly increase, while in winter, people crowd the ski resorts. People often visit amusement parks on Sundays and holidays. Take measures (such as reduced scheduling or longer station stops) to deal with the situations when there are few passengers.

Most maps have a lot of facilities belonging to the other companies. Competition among the same types of businesses will contribute to the development of the city. When the city has several of the same types of enterprise, the city becomes larger. There's no limit on land purchase, but there is a restriction on the number of commercial properties that your company can erect: 18 of any subsidiary property, 60 properties total.

MATERIAL SUPPLY

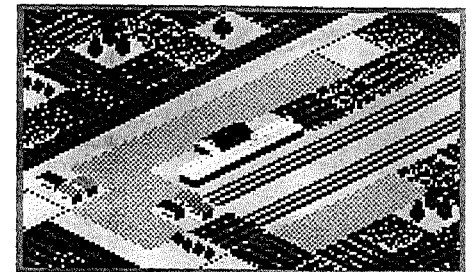
Materials are essential to the city development. All buildings are constructed with materials, whether by you or the hand of the A-Train simulation deity. When building a station, purchase the land that will be used as the materials-storage place when you build the station. As you expand your city, materials are gradually consumed, so you have to use your freight trains to carry in materials from factories or from the stations outside the map.

The materials piled up at the factory sites need to be transported once by one of your trains before they can be used. You can, however, directly use the factory materials when you erect buildings within 10 blocks of the factory storage place.

The materials-storage place should be located within eight blocks of the station—otherwise it can't be used to load or unload materials. Look at the Building Types and Statistics chapter below for information on how many materials are required for particular subsidiaries and other types of construction.



The Building Manager will always check your hall pass.



BUILDING AN EMPIRE

If there are construction materials available, you can construct buildings around the station within an eight-block radius. With materials available, residences will begin to appear a short distance away from the station. The residences should reach enough numbers to constitute a residential town—a bedroom community.

These residential inhabitants are the labor force needed for the construction and operation of various facilities. If there are no more new building sites, the population won't increase, and residences won't be naturally constructed by the simulation. The reason that residences are rapidly built when there are only two stations right after the start of the game is that the cities outside the map need a labor force. The needed labor force varies from one map to the next.

After a while, when a number of residences and public buildings have been built, the construction speed will slow down. When it does, build department stores and other commercial income property to increase employment. If you develop these kind of building lots, the construction of new residences by the simulation will continue. It's all right to develop property outside the town if you have a strategic overview of future connectivity. You can also construct leisure facilities such as stadiums and amusement parks if your population can support them. Other companies will also build hotels and commercial properties around stations.

Residences and public buildings are constructed more quickly by the simulation on land that you have sold after purchase. There is no fee for purchasing/selling land, but there are expenses for the development of building lots if it is necessary to clear the land.

Residences are rapidly built by the simulation if the blocks are vacant lots. If there are farms, ranches or woods on the blocks, the blocks are first changed into vacant lots, and then residences will appear. This can take a good deal of time. When farms and ranches are destroyed by the program, that agricultural industry is on its gradual decline, and won't be restored. When woods are uprooted, they cannot be planted again. Thus it's important to make a good city plan that recognizes these contingencies and allows for them—if you want to retain an agricultural flavor, for instance—before you begin the development of building lots.

After awhile, a street begins to extend from the rear of the big stations at a right angle from the track. Buildings will be constructed along

the street by the simulation. (The street will not be built up by the program with skyscrapers and big buildings unless you choose the large stations.)

Buildings directly constructed by the simulation are usually about 10 blocks from the station. After the residential development around the station has been completed, the demand for materials decreases. The simulation will then begin the street construction, and local rentable buildings will become taller, all of which may consume a lot of materials. Building-expansion by the simulation will occur if there are materials within 12 blocks.

PUBLIC FACILITIES

Besides the residences and the urban street, the simulation will also build small office buildings, stores, schools, hospitals and public parks.

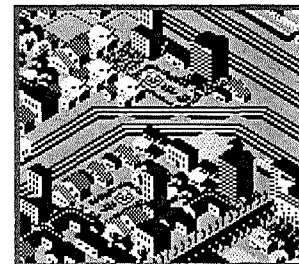
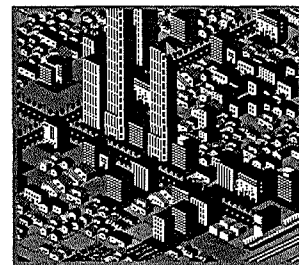
All of the facilities built by the simulation are a natural consequence of growth. The roads and parks belong to the public, so you can't buy them or construct facilities on them.

Occasionally, depending on how you develop the map, the town will not naturally grow to become more than a bedroom community. If this is the case, it's necessary to create additional opportunities for employment by building factories, etc. However, make sure that you have enough cash flow to cover new and old debts.

When the land in back of a station is owned by other companies and they have erected large buildings, or there are buildings other than residences and public buildings on the land, the urban road can't be built by the simulation—it won't appear. You can buy the land in back of the station, but don't develop it with any facilities; if conditions are right, the road should appear soon after you sell the land. When a road appears, big commercial projects and lease buildings of considerable size can be constructed by the program.

*Commuter—one who spends his life
In riding to and from his wife;
A man who shaves and takes a train
And then rides back to shave again.*

— E. B. White



CROSSROADS —

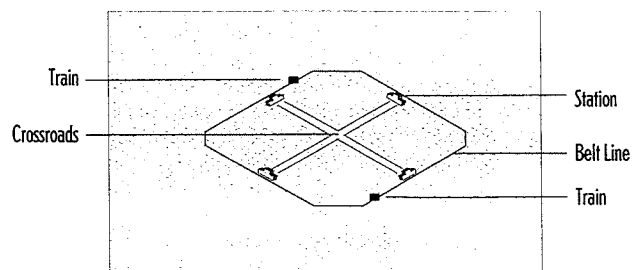
THE ULTIMATE SHAPE OF A CITY

In the map below, there is a crossroads where two roads intersect. Designing your city center around a crossroads like this has a great effect on the city development. The city center will move from the station to the crossroads. Around the crossroads, various buildings will be built by the simulation, just as they are around the station. If the station materials-storage place is also near the crossroads, those materials can be used for this development.



The price of the land around the crossroads will greatly increase. High-rise buildings are easily constructed by the simulation under these prospering conditions. To develop a big city with many large offices, the crossroads is essential.

The city outline shown in the bottom figure displays an optimum shape for successful expansion. There are four stations around the belt line. If there are materials at one station, they can be used to construct buildings almost everywhere in the area. Your rail passengers will increase as you develop the city.



If you have built according to these suggestions, you should be able to jump to the next city scale goal. After the development around your first stations has been settled, repeat the above procedure in a new place. You can build flourishing cities—your empire—everywhere on the map!

GENERAL BUILDING GUIDELINES

- The BUILD and REMOVE commands are on all the menus.
- The building area varies with the type and the scale of the building to be constructed.
- To construct a building on land not owned by the company, you must have the money for both land purchase and the construction expenses. Sometimes the land may not be for sale. In such a case, you can't build.
- The buildings that don't belong to your company can't be removed unless you buy them, and they are not always available for sale.
- A signboard (small square) representing ownership by your railroad company is put on the top of each building. It will be removed if you sell the property.
- The building materials must be near the construction site for successful erection.

BUILDING TYPES AND STATISTICS

Residence
Materials: 2
Expense: 0
Labor force: N/A



The player cannot build residences—they are a natural consequence of certain game conditions. There are 8 families in one block, each family having 7.5 members. There are 16 types of residences, but every residence has the same number of members and a similar economic state. There are about 60 people living on one block.

Apartments
Materials: 8
Expense: 340,000 dollars
Labor force: 10 people



There are 150 families in one apartment complex, each family having 3.5 members. The operating expense of a complex is 150 dollars to 200 dollars per day. Income is over 300 dollars if it is in front of

a station, but apartments will produce a deficit if they are located far away from the station. If there are lease buildings or amusement parks nearby, income will moderately increase. There are three types (and prices) of apartment complexes, and there are no differences between them in operating expenses and income.

Factory

Materials: 20

Expense: 250,000 dollars

Labor force: 500 people



Factories produce construction materials, which should be transported from the factory by freight trains to areas outside the map if you don't use the materials yourself. The operating expense is 200 dollars a day, even when the factory stops working (after your materials-storage place has been filled with materials). Each material is sold for 250 dollars, and a three-coach freight train can carry four materials in a time. If you need a lot of materials, factories can be linked together to increase production.

Public Buildings

Materials: 4

Expense: 0

Labor force: 60 people



Built by the simulation in the residential areas, public buildings may represent schools, hospitals or shops. There are eight types, which vary with your city's development process. The more public buildings, the bigger the city.

Lease Buildings

Materials: 10 for the first 5 stories;

8 for each additional 5 stories up to 40

Expense: 240,000 dollars (5 story)

Labor force: 120 people and up



Lease buildings can be up to 40 stories tall; every five stories takes up a block. There can be 1,000 people working in one building. The operating expense is 40 dollars to 45 dollars per day. The income is from 80 dollars to 90 dollars a day for a building near a station, and 50 dollars to 60 dollars if the building is far away from the station. The income may increase when there are hotels in the neighborhood. Income for lease buildings is calculated by building height; every five floors is considered another "block," i.e., another income unit.

Commercial Buildings

Materials: 12

Expense: 1,200,000 dollars

Labor force: 550 people



To gain a profit, build your department stores and offices near a station. The operating expense is 2,300 dollars to 2,600 dollars per day, increased by 30% for holidays. The income is 2,200 dollars to 2,700 dollars if the store is near a station, and less than half that if the station is far away. Income increases by 50% on holidays. If there are many residences, apartments, lease buildings and hotels nearby, the income can increase by at most 500 dollars a day. Income rises by 20% to 30% in December, and decreases by 10% to 20% in February and August. Income will also decrease by 20% to 40% when there is a rival store.

Hotel

Materials: 12

Expense: 1,000,000 dollars

Labor force: 550 people



The income of a hotel varies greatly with the location. The operating expense per day is 1,700 dollars to 1,900 dollars. The income per day is about 1,400 dollars if the hotel isn't close to a station, and 1,600 dollars to 1,850 dollars when near a station. The income can be increased by at most 200 dollars a day on working days if there are factories and lease buildings nearby, and at most to 500 dollars on holidays if there are residences and apartments nearby. The presence of recreational facilities can also boost income. Your income can decline by 10% to 30% when other competing hotels open.

Stadium

Materials: 20

Expense: 1,000,000 dollars

Labor force: 150 people



The operating expense of a stadium is 240 dollars to 260 dollars per day. The income per day is 80 dollars when it is not close to a station, and 140 dollars when a station is nearby. Income will rise by 1 dollar per 1,000 residents, and increases by 50% on holidays. If there are residences, apartments, lease buildings and hotels nearby, your income may rise by up to 500 dollars daily. But income will decline by 20% to 30% when there is a competing stadium within 14 blocks.

Ski Resort
 Materials: 8
 Expense: 747,600 dollars
 Labor force: seasonally dependent



To construct a ski resort, you need a mountain that has a wide slope. (Map Four has no such mountains.) The opening period is December through February. The operating expense per day is 50 dollars in the off-season, about 960 dollars when open, and double on holidays. The income is 1,300 dollars when the resort is not close to a station, 1,660 dollars when it is close to a station, and three times that on holidays. The income increases by 160 dollars for each hotel nearby, and drops by 20% to 40% when a rival resort opens nearby.

Amusement Park
 Materials: 24
 Expense: 1,900,000 dollars
 Labor force: 200 people



The operating expense per day is 750 dollars to 1,000 dollars. The income is 390 dollars when it is not close to a station, 550 dollars to 720 dollars otherwise. The income rises 1 dollar for each 1,000 residents, and rises by 50% on holidays. If there are residences, apartments and hotels nearby, the income increases by up to 200 dollars daily. Revenues decrease by 20% to 40% when a rival appears. There are fireworks shows on Saturday nights.

Golf Course
 Materials: 8
 Expense: 2,050,000 dollars
 Labor force: 200 people



The operating expense of a golf course doesn't depend much upon the station. It costs 2,220 dollars to 2,442 dollars per day, and increases by 50% on holidays. The income per day is 2,310 dollars on working days and double on holidays. If there are hotels, residences and apartments nearby, the income increases. If the course is near a station, the income increases by 10%. When there is another golf course, the income can be reduced by 20% to 30%. The course doesn't open in winter.

Small Station
 Materials: 4
 Expense: 40,000 dollars
 Labor force: 150 people



The small stations have red roofs. Residential areas with up to eight apartment complexes and two hotels will be built by the simulation near the station if development conditions are right. Of course, you can construct as many buildings as you like in proximity to the station. The operating expense per day is 5 dollars plus 1 dollar for each 10 passengers passing through. The income is zero when there are less than 100 passengers, 2 dollars for 101 to 300 passengers, 4 dollars for 301 to 500 passengers, and 6 dollars for more than 500 passengers (per trainload, station-to-station). Fares are calculated separately as part of rail company income. Both small and large stations receive additional income from gift shops and other tenant sales dependent on passenger numbers.

Large Station
 Materials: 8
 Expense: 120,000 dollars
 Labor force: 150 people



Urban roads and skyscrapers can be built by the simulation only behind large stations. The operating expense of a large station is 9 dollars per day, plus 1 dollar for each 10 passengers passing through. The income is zero for less than 100 passengers, 7 dollars for 101 to 300 passengers, 10 dollars for 301 to 500 passengers and 12 dollars for more than 500 passengers.

Park
 Materials: 4
 Expense: 0
 Labor force: 0



Parks are built by the simulation according to the local budget. But they cannot be built when the figure representing the local budget in the URBAN GROWTH window is less than \$2,000,000. They are usually built at the final stage of city development. When a road extends though a park, the park will be destroyed.

Road
Materials: 2
Expense: 0
Labor force: 0



The conditions for which a road is built (by the simulation) vary with the number of apartments, hotels, lease buildings, railroad passengers and station size. For each block, two materials are needed for the road and six materials for a bridge.

LAND CLEARING EXPENSES AND TERRAIN INFORMATION



Cleared Land

Blocks encircled by dashed lines represent the plain land on which residences and public buildings can be constructed directly without land-clearing expenses. The land is owned by somebody besides you until you shell out the dough.



Wood

Blocks with only a single tree as well as true forestlands are called "woods." (It's a sign of our optimism.) To turn a wood into cleared land costs 100 dollars.



Farm

To turn a farm into cleared land costs 200 dollars.



Ranch

To turn a ranch into cleared land costs 200 dollars.



Hill

There are some hills where ski areas can be built on slopes.



River

A river has little effect on the city development, but a railroad or a road can't go through the river without a bridge being built.



Sea and Lake

Nothing except Shinkansen can be built on a sea or a lake, and the program does the building.

MYSTERIOUS FLYING OBJECTS

You might occasionally see some migratory birds flying in group formation on your map: they are red-crowned cranes. They fly south October 1–2, north April 5–6. They appear at 5:00AM and take about one day to cross the map.

MONEY AND ITS MANAGEMENT

HOW TO MAINTAIN THE COMPANY

At the beginning, it's foolish to build long, lavish railroads with the initial company assets. For some maps you will need to secure some bank loans to open business lines based on the original holdings. It is a good idea to lay short, cheap railroads in your initial phases of development.

You can take out a loan anytime. Your loan limit is about 30% of the company assets—The greater the company assets, the greater the limit. There are one-year, two-year and three-year loans; the rates rise with the term length. You can see the due dates by clicking the DEBT TOTAL button in the BANK window. If you can't pay at that time, your company will go bankrupt. You are limited to 8 loans outstanding.

Bank			
Credit Limit:	1,263,000	1 Year:	6 %
Loan Amount:	12,000	2 Years:	7 %
Interest:	1,680	3 Years:	8 %
Due Date:	May/17/03		
<input type="button" value="x100,000"/> <input type="button" value="x1,000"/>		<input type="button" value="1 Year"/>	
Cash:	1,104,209	Debt:	0
		<input type="button" value="Debt Total"/>	
		<input type="button" value="Borrow"/>	
		<input type="button" value="Exit"/>	

Large loans should be made when the interest rates are low. The lowest rates are 2% for one-year debts, 3% for two-year debts and 4% for three-year debts.

Frequently check the sales of your rail operation. Extended rail lines have increased expenses, and require a longer time period to turn a profit. Make sure that you have enough insurance capital in case expenses become greater than your income.

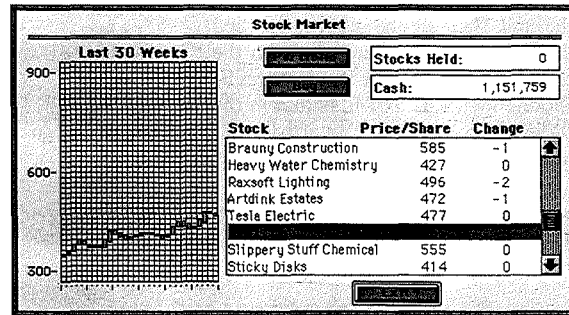
Debts		
Due Date	Payables	Interest Rate
May/17/03	13,680	7 %
Total:		13,680
<input type="button" value="Exit"/>		

The land prices rise as the city grows. Be aware that land holdings are taxable. Keep in mind the dates when your taxes and other debts are due. If the company operating funds are negative, the company will go bankrupt and your trains will run no more.

STOCKING UP

Watch the current (and constantly changing) financial circumstances of the city to seize every good opportunity to make a killing by getting good bank loans or by selling off stocks. You can play the game without doing any stock trading, but if you're careful, it can be a valuable source of surplus funds. However, as many sad traders know, it's not an absolutely reliable way.

There are 24 stock brands. You can scroll the board to view them all. The two numbers after the company name represent its trading value and the amount by which it has dropped or risen since the day before. After you select a particular stock name, a graph appears to show the price variations of the stock over the past 30 weeks. You may find that the stock prices change considerably over two-month periods for many brands. There are also brands whose stock price won't change much over several months. The fluctuations don't depend on the brands, but vary with each game.



Try to discern a fluctuation pattern for stocks you're interested in and buy when the price is at the bottom of the curve and sell when the price is at the top of the curve. (Mama didn't raise no fool.) Of course, it can be difficult to know just *when* the top of the curve has occurred.

The stock price of a brand might display a trend of increasing value over a six-month to one-year period. But a stock slump may also happen once every year and a half or so. Be alert to trends by checking the stock board frequently and paying attention to the advisors in the message windows. If a slump occurs, the stock price will drop to one-half or one-third of its past price in a day.

STOCK BRANDS

Do-Beeus Trading: a worldwide general trading company.

Twisstad Metal: a company that manufactures metal materials used for cars, trains and ships.

Pickupstik Construction: a construction firm skilled at building skyscrapers, halls and domed stadiums.

Whozit & Whatzit Export: a general trading company that imports and exports various materials such as foods and chemicals.

Mjollnir Products: a company that makes iron and steel products for building construction.

D.G. Nuts & Bolts: a construction company that builds residences, factories, etc.

Tricks o' Trade: a general trading company.

Big Iron: a big iron company.

Radon Realty: a big real estate company that owns most office buildings in the big cities.

Anything Goes Trading: a general trading company.

Taffy Steel: an iron company.

Brauny Construction: a construction company that builds mainly residences.

Heavy Water Chemistry: a company that produces chemical fertilizers and chemicals.

Raxsoft Lighting: a general household electric appliance company that produces lighting equipment, audio-visual equipment and computers.

Artdink Estates: a real estate company that deals with residences and apartment complexes.

Tesla Electric: an electrical company that makes wires and electrical equipment used in factories and buildings.

Maxis Motors: a general electrical company that makes household appliances and motors.

Slippery Stuff Chemical: a chemical company that produces lubricants, detergents and wax, etc.

Sticky Disks: a company that produces various magnetic media such as cassette tapes and floppy disks.

Spinnin' Wheels Auto: a big automobile company.

JoeCo Gas: a city gas company.

I.B.BRE.M.: a big communication company that has the second-largest share of the world market.

JSmgmt: a company that is known for developing a new material with wide applications.

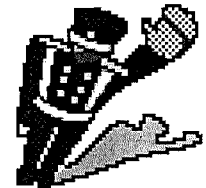
JenSuz Power: an electric power company that supplies electricity to generators for big cities.

RAILROAD TALK

Ornament—Station master

Peg—Train rider who lost a foot

Pig Pen—Locomotive roundhouse



TRACKING YOUR TRAIN COSTS

The running expenses of the railroad company are your prime expenditures. Naturally, you can't get income without incurring some development expenses. Your profit, obtained by subtracting the expenses from the income, is added to the cash figure you see on your financial reports. If you have a negative profit, your cash is reduced by that figure.

The expenses of the railroad branch are calculated hourly, and include a 1 dollar charge for every 10 passengers per train. The hourly expenses of a running train vary by train type and speed; a high-speed train with three cars, such as an AR III, costs 9 dollars per hour. The train's income is relative to the travel distance, fare and the number of passengers.

Use the RAILROAD OPERATION window to see your company's profit and loss figures. If the balance is a negative figure, your company has a deficit. This window charts the information on your available cash, debts and the estimated amount of taxes for your company.

Cash is the money used for purchasing and construction. Your company will go bankrupt—and your game will be lost—if your cash becomes a negative figure. Debts are the total monies borrowed from banks. They must be paid on the appointed dates.

This window also charts the status of the railroad sales and expenses. A figure will appear in the Taxes column after estimation. The amount of tax is estimated on March 31, and is due on June 1. It's essential that you have a cash reserve to cover your tax expenses.

Today: sales, expenses and income for today are displayed.

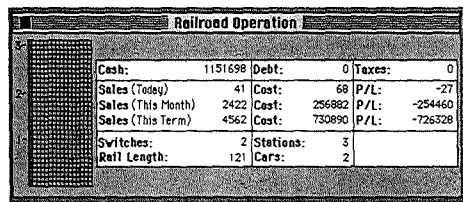
This Month: the business report from the first day of this month to yesterday is displayed.

This Term: the business report from April 1 to yesterday is displayed.

You can also use this window to determine the physical holdings of your rail empire:

Stations: the total number of stations on the map.

Switches: the total number of switches on the map.



Railroad Operation			
Cash:	1151698	Debt:	0
Sales (Today)	41	Cost:	68
Sales (This Month)	2422	Cost:	256882
Sales (This Term)	4562	Cost:	730890
Switches:	2	Stations:	3
Rail Length:	121	Cars:	2
Taxes:	0	P/L:	-27
		P/L:	-254460
		P/L:	-726328

Trains: the total number of trains owned by the company.

Rail Length: the total length of railroads (in blocks).

Balance Graph

The strips in the graph show the difference between the income and the expenditures. If the color is red, the expenditure is greater than the income. If the color is black, the income is greater than the expenditure. The vertical axis represents money, and the horizontal axis time—the changes are recorded in one-month blocks.

The income of subsidiary companies can be viewed in the SUBSIDIARIES window. At 9:00PM, each train station tallies its daily income and expense figures.

All of your company funds are deposited in banks paying an interest rate of at least 0.1%. The company collects the interest once a month. Stock dividends are paid once a year on July 1. You will get an on-screen message: "You have received a dividend." Don't forget that you pay taxes on June 1—you MUST have enough money set aside for this purpose or the game is kaput.

The most critical factor in your commercial success is the income of the railroad branch—it's the base of the company. The second most important is the income from subsidiary companies. You might find it useful to always display the RAILROAD OPERATION window on the screen during game play (Mac only). Check your cash when you want to purchase something.

BUSINESS FLUCTUATIONS

The macro-economics of the game are complex. It's hard to anticipate all business fluctuations, because some of the business conditions have random elements built in. When the business conditions deteriorate, the number of railroad passengers decreases by 10%.

In April and December, when there is a great demand, your business is sure to be in good shape. But if there is a stock market slump, a recession will follow. Your income changes also have a small effect on business successes, and so does the balance between supply and demand of the labor force.

RAILROAD TALK

Pocatello Yardmaster—Derisive term for boomers, all of whom presumably claimed to have held, at some time, the tough job of night yardmaster at Pocatello, Idaho

Proper Stiff—Hobo who considers manual toil the acme of disgrace

Real Estate—Poor coal mixed with dirt or slag. When mixed with sand, it is called seashore

Balance Sheet			
Assets		Market Value	Property Tax
Railroad Assets:		996500	49825
Subsidiaries:	9	2989716	149485
Stocks:	0	0	0
Real Estate:	44	142000	7100
Total:		4128216	206410

Revenue		Expenditures	
Railroad Operation:	5435	Railroad Operation:	733056
Subsidiaries:	41448	Subsidiaries:	37670
Subsidiary Sales:	0	Subsidiary Purchase:	3096100
Stock Sales:	0	Stock Purchase:	0
Real Estate Sales:	0	Real Estate:	28200
Stock Dividends:	0	Commission:	0
Interest Income:	1151	Interest Paid:	0
Total:	48034	Total:	3895026
Profit/Loss:	-3846992	Income Tax:	100
Cash:	1153008	Total Tax:	206510

There are two dominant expenses: the temporary or fluid ones, such as the railroad construction/removing costs, the cost for purchasing lands and the fee for purchasing trains; the ongoing expenses consist of personnel expenditures and everyday fuel costs.

Your subsidiary companies, like factories and department stores, also incur expenses. To see the expenses of subsidiary companies, use the BALANCE SHEET. The subsidiary companies can make profits by expanding the city and helping to develop new stations and railroads. When the profits of an individual subsidiary company are poor, you should consider selling it using the SUBSIDIARIES window.

SETTLEMENT OF ACCOUNTS

The simulation will settle your accounts for the year by calculating the final income and expenses. The amount of taxes is also estimated. You must take measures to ensure that your cash figure isn't lower than your tax due. The tax and debts are paid on the following weekday if the corresponding due date is a holiday.

Your term profits will be taxed at 50% and your assets at 5%. Thus the principal way to save on your tax bill is to spend your profits to purchase assets—subsidiary companies, lands, stocks, railroad facilities, etc.—before the March 31 tax estimate. (You can see the figure in the Taxes column in the RAILROAD OPERATION and BALANCE SHEET windows.)

You can turn any profit into newly purchased subsidiary companies before the settlement of accounts, and sell them in the new year. Since a subsidiary company can gain a profit by itself, in many cases it won't be a "loss" to purchase it. Besides, the appraised value of the subsidiary company may grow. But the money you get from selling the subsidiary companies will add to the profit of the new year, so the cycle of buying and selling might have to be repeated every year. It is sound—and necessary—policy to consider the development and/or sale of subsidiary companies as an integral seed in your overall financial flowering. You are restricted to a total of 15 subsidiary sales in a single year.

Within a limit of 18 for each category and 60 total, you can choose the following buildings and facilities for your company development: factories, commercial properties, hotels, golf courses, amusement parks, stadiums, ski resorts, apartments, and lease buildings.

Your railroad company logo, in the form of a small box, will appear on top of the building or facility after purchase. (The logo will be removed after it has been sold.) Some buildings and facilities can't be bought or sold depending on how much speculating you have done and the development state of the game.

Subsidiaries				
Cash:	1,153,759	Sales (This Term)	Profit (This Term)	Market Value
				Commission
		6237	1627	379320 12586
		6237	1617	353720 12074
		695	193	392620 12852
		695	215	367020 12340
		695	183	391620 12832

Purchasing land is also a reasonable method of investing profit, but it saves you less than buying a subsidiary company, because the price of one block of land is far cheaper. Purchasing stocks is probably the easiest way to avoid the profit tax. But keep in mind that there may be a stock market slump. It's also possible to save taxes by laying railroads or purchasing trains. If you don't have enough time (or money) to make a plan for laying railroads, it is better simply to purchase trains and hold them for the future.

Portfolio			
Stock	Purchase Amt.	Price	Market Value
Master Motors	100	46,500	46,500
Total:	100	46,500	46,500

READING THE BALANCE SHEET AND CALCULATING YOUR TAXES

Use the BALANCE SHEET to learn about the current financial management of the company, your assets, and as a basis for planning. You can find itemized information on assets, their appraised values and the corresponding taxes.

There are three main parts: assets, revenue and expenditures. As mentioned, there are two types of tax: asset tax and profit tax. For assets, such as subsidiary companies, stocks and lands, the tax is 5% of their appraised value. The tax does not vary with the overall business balance of the company.

The profit tax is 50% of the company profits, which are obtained by subtracting the expenses from the whole incomes. The minimum amount is 100 dollars, even when the company is operating at a deficit.

The tax amount is calculated on March 31, and paid on June 1. Keep in mind the company will go bankrupt and the game will end if there is not enough money to pay your taxes on June 1.

Balance Sheet			
Assets		Market Value	Property Tax
Railroad Assets:		996500	49825
Subsidiaries:	9	2989716	149485
Stocks:	0	0	0
Real Estate:	44	142000	7100
Total:		4128216	206410

Revenue		Expenditures	
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Stock Dividends:	0	Commission:	0
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Cash:	1153008	Total Tax:	206510

RAILROAD TALK

Side-Door Pullman—Boxcar in which hoboes steal rides
Skin Your Eye—Engineer's warning to the man on the opposite side of a locomotive cab when approaching a curve
Slips—Bananas shipped by rail

THE BALANCE SHEET

Assets

Railroad Assets

The railroad track in one block is worth about 1,500 dollars, a switch 1,550 dollars. A small station is worth 48,000 dollars, and a large station 196,000 dollars. This is in addition to the valuation of purchased trains.

Subsidiaries

The appraised value is the total amount of market values of all subsidiary companies. Each appraised value varies with the income of each separate subsidiary company.

Stocks

The appraised value is the total market amount of the stocks you have at the time.

Real Estate

The appraised value is the total amount of the current market prices of your land holdings.

Revenue

Railroad Operation

The total amount of the sales of the railroad branch from April 1 to the present.

Subsidiaries

The total amount of sales of all subsidiary companies from April 1 to present. You can find the sales of each subsidiary company in the SUBSIDIARIES window.

Subsidiary Sales

The total amount obtained from selling subsidiary companies.

Stock Sales

The total amount obtained by selling stocks.

Real Estate Sales

The total amount obtained by selling lands.

Stock Dividends

The dividends of all your stocks are paid on July 1. They vary between 8% and 28% per year.

Interest Income

The total interest on your cash balance for this term (from April 1 to present).

Expenditures

Railroad Operation

The sum of operating expenses of trains and stations.

Subsidiaries

The total operating expenses of all subsidiary companies.

Subsidiary Purchase

The total price of purchased subsidiary companies.

Stock Purchase

The total price of purchased stocks.

Real Estate

The total price of purchased land.

Commissions

The fee totals of this term. When buying stocks, there is a charge of 10 dollars for each share of purchased stock and a basic fee of 50 dollars. When you sell a subsidiary company, you obtain the basic fee of 500 dollars, in addition to a commission of 2% of the appraised value of the company.

Interest Paid

The interest totals paid on all debts.

Balance

The difference between the total income and the expenses.

Income Tax

This tax takes 50% of the profits. When there is no profit, it takes 100 dollars.

Cash

The total cash at present.

Total Tax

The sum of the profit tax and the asset tax. It is estimated on March 31 and due on June 1.

Railroad operation figures are calculated hourly. The consolidated income and expense figures of your subsidiaries for the hours between 11:00 and 7:00 are calculated daily, along with the station sales and expenses at 9:00PM. Interest income on your cash balance is the sum of your lowest balance multiplied by 0.1% once monthly. Stock dividends are distributed on July 1.



The Golf Course Manager will keep you on (and in) the green.

RAILROAD TALK

Tail Over Her Back—Designating an engine with a full head of steam, with a plume resembling a squirrel's tail from the safety valve

Throwing Away The Diamonds—Spilling a scoop of coal by missing the fire door

Trampified—The way a boomer looked when long out of work. His clothes were "ragged as a barrel of sauerkraut" and he needed "a dime's worth of decency" (shave)

TRAIN CATALOG

KIHA 40 — a diesel passenger train used on a local line in cold places.

Coaches: 2
Speed: 2 blocks/hour
Seats: 400
Price: 33,000 dollars
Passing stations: incapable



201 — a commuter train with a large seating capacity.

Coaches: 3
Speed: 2 blocks/hour
Seats: 600
Price: 50,000 dollars
Passing stations: incapable



415 — a commuter train with a stainless-steel body. More suitable for suburban travel than a 201 model train.

Coaches: 3
Speed: 2 blocks/hour
Seats: 580
Price: 53,000 dollars
Passing stations: incapable



205 — a commuter train used in a metropolitan city.

Coaches: 2
Speed: 3 blocks/hour
Seats: 440
Price: 46,000 dollars
Passing stations: incapable



211 — a stainless-steel suburban commuter train.

Coaches: 3
Speed: 3 blocks/hour
Seats: 640
Price: 70,000 dollars
Passing stations: incapable



AR — an electric commuter train with the largest seating capacity.

Coaches: 3
Speed: 3 blocks/hour
Seats: 700
Price: 80,000 dollars
Passing stations: incapable



KIHA 82 — a super-express diesel passenger train.

Coaches: 2
Speed: 2 blocks/hour
Seats: 420
Price: 53,000 dollars
Passing stations: capable



113 — a direct-current electrical train used on suburban lines running by the sea.

Coaches: 3
Speed: 2 blocks/hour
Seats: 640
Price: 80,000 dollars
Passing stations: capable



FP 45 — a stylish suburban diesel express train.

Coaches: 3
Speed: 2 blocks/hour
Seats: 580
Price: 90,000 dollars
Passing stations: capable



381 — a super-express passenger train designed especially for running on curved lines.

Coaches: 2
Speed: 3 blocks/hour
Seats: 470
Price: 98,000 dollars
Passing stations: capable



EF 65-24 — a long-distance night passenger train that has a small seating capacity and high ticket fares.

Coaches: 3
Speed: 3 blocks/hour
Seats: 500
Price: 180,000 dollars
Passing stations: capable



AR III — the most expensive but profitable passenger train.

Coaches: 3
Speed: 3 blocks/hour
Seats: 600
Price: 250,000 dollars
Passing stations: capable



KIN 30000 — a super-express passenger train with double-deck coaches.

Coaches: 2
Speed: 2 blocks/hour
Seats: 460
Price: 50,000 dollars
Passing stations: capable



NISHI 5000 — a super-express passenger train.

Coaches: 3
Speed: 2 blocks/hour
Seats: 600
Price: 80,000 dollars
Passing stations: capable



MEI 7000 — an express passenger train used for tourism.

Coaches: 3
Speed: 2 blocks/hour
Seats: 560
Price: 90,000 dollars
Passing stations: capable



DD 51 — a freight train.

Coaches: 2
Speed: 2 blocks/hour
Materials: 2
Price: 46,000 dollars
Passing stations: capable



EF 62 — a freight train.

Coaches: 3
Speed: 2 blocks/hour
Materials: 4
Price: 76,000 dollars
Passing stations: capable



ED 76 — a freight train.

Coaches: 2
Speed: 3 blocks/hour
Materials: 2
Price: 73,000 dollars
Passing stations: capable



GP 40 — a freight train.

Coaches: 3
Speed: 3 blocks/hour
Materials: 4
Price: 116,000 dollars
Passing stations: capable



The income of a passenger train is proportional to the distance traveled. For instance, an AR III traveling less than 13 blocks will only earn 23% of its potential ticket revenues, but when it travels greater than 35 blocks, it can earn 150% of potential ticket revenues. The higher-capacity, more expensive trains generally have higher fares, as well as higher initial purchase prices.

By Their Names You Shall Know Them

A selected list of some of the royal and not-so-royal names in railroading, including locomotive/engine types and famous cars, as well as some flagship trains of the great lines.

The Owl	The General Pershing	The Ponchartrain
El Capitan	The Golden State	The Queen of
Man o' War	The Havana Special	the Valley
The Aristocrat	The Hiawatha	The Rebel Missourian
The Best Friend	The Hustler	The Red Arrow
of Charleston	The Iroquois	The Royal Palm
The Betsy Ross	The Janus	De Luxe
The Black Diamond	The Jeffersonian	The Sandusky
The Blue Bird	The John Bull	The Senator
The Bluebonnet	The Knickerbocker	The Shasta Daylight
The Camel	The Lebanon	The Silver Meteor
The Challenger	The Lightning	The Silver Star
The Cincinnati	The Mercury	The South Shore
The City of Miami	The Midnight Special	Express
The Coast Starlight	The Minute Man	The Sun Queen
The Commodore Vanderbilt	The Mohawk	The Suwanee
The Congressional Limited	The Niagara Rainbow	River Special
The Death Valley Coyote	The Nickel Plate Limited	The Texas
The Dixie Flyer	The Night Diamond	The Thomas Jefferson
The Empire Builder	The Old Ironsides	The Trail Blazer
The Fast Mail	The Oriental Limited	The Twenty Grand
The Flamingo	The Pacemaker	The Vixen
The Florida Special	The Paul Revere	The Wolverine
The Florida Sunbeam	The Phoebe Snow	The Yankee Clipper
The Flying Crow	The Pocahontas	The Zephyr
The General	The Ponce de Leon	The Zipper

Q. How can I use the trains effectively?

A. A passenger train is used to carry passengers, and a freight train to transport construction materials (elementary, my dear engineer). A key point is to know what type of train is profitable. The AR III model is the most efficient passenger train. A three-coach AR III (which seats 600) is a high-speed train with the lowest operating cost, though its purchase price is somewhat expensive. The three-coach high-speed ED 76 model is a decent choice for a freight. But keep in mind that you should have the freight trains in operation only when you have a need for construction materials. Make it a rule to remove your freights from lines when they aren't contributing to your operation.

Q. What is a good approach to initial railroad building?

- A. To lay a profitable railroad, pay attention to the following points:
- (1) Build a station near your initial or new central station. The distance between the stations should be over 15 blocks (squares).
 - (2) Lay track between the stations. The railroad lines should be as straight as possible.
 - (3) The longest distance between the stations should be approximately that over which an AR III train can run in 24 hours (about 60 blocks). Otherwise the train can't finish one run in a day.
 - (4) It is better to lay double lines between stations or double lines at the middle of a single line in order to run a freight train as well as a passenger train in the opposite direction.
 - (5) Don't build a belt line that has more than three stations at the beginning of the game.

Q. Can I build a bridge over a river?

A. Yes, but keep in mind that a bridge can be built over a river only on the blocks where the river goes straight and the bridge crosses the river at a right angle. Since there are few such blocks, you had better research your map before including a bridge in your rail plan. By the way, there are some ponds that are only a single block in size. You can lay a railroad over these ponds without any difficulty.

Q. *How should I set up my schedules?*

- A. To make a profit, you should set the departure time for every passenger train at 8:00AM at the beginning of the game, upon the sensible reason that people most often take their trains at 8:00AM. Don't let trains depart in the middle of the night or in the very early morning except when there are more than 1,000 passengers available at those periods. Departure times of freight trains have no relationship to their income, so they can be set freely, unless you want a strict control over the flow of construction materials.

Q. *What are the railroads connected to outside the map?*

- A. There are initial railroads on each map on which passenger trains and freight trains are running. These railroads are connected to the cities outside the map for carrying people and materials in and out.

These railroads and trains are owned by you. You can remove the track and stations or add new railroads and stations, but you can't remove the trains or change the switches.

Of course, you can run new trains on the railroads. If a freight train runs outside of the map, for example, the train will bring back construction materials that you want. Notice that the initial train will change its moving direction when it's about to have a head-on collision with any train you put on the line. Trains will also carry the construction materials away, and the materials will be sold.

Q. *Is it OK to intersect existing tracks with new lines?*

- A. You can't build a railroad that crosses over another railroad or which attempts connection to another railroad at a right angle. But a railroad can be connected to another railroad at an angle of 45 degrees. Two lines can intersect in an X-letter shape. This approach can be used when you want to change two parallel lines at some place without a switch.

Q. *What is a sound approach to building stations?*

- A. At the beginning of the game, the stations should be built near the places where there is a concentration of many houses—for example, near the initial station.

The type of city you are developing is another issue that affects placement. Tightly placed stations focus development and loosely placed stations spread it more evenly.

At the beginning, residential areas and streets are developed around the stations and railroads by the simulation. If you've built large stations, the next simulation development stage will produce larger buildings on both sides of the straight road that will stretch from the large stations. Land prices will increase greatly at this time, especially when roads from these first two stations have a proper (90-degree) intersection. Position any new stations so that the two roads intersect at a right angle.

The distance between the two stations is also very important. If the stations are too close, the fares will be very low, and consequently so will be your income. If the two stations are separated at a great distance, there will be no streets developed between the two roads. It's advisable to remove stations whose roads have extended very far, and reposition them where the new roads will more easily extend to make connections, increasing land value and operating profits.

Q. *How can I make good use of the construction materials?*

- A. One of the most difficult things in the game is how to use the construction materials effectively. If there are no construction materials, you cannot construct any buildings even when you are cash rich.

There are two sources of construction materials. One is that the freight trains carry the construction materials in from neighboring cities outside the map, and the other is that your factories can produce the materials. You might first build factories to produce construction materials, and then use the materials to construct buildings for your company. You can't use materials if they aren't transported once from the factory storage using your freight trains—it's necessary to move the factory materials to a materials-storage place. To do so, you should build a station (at which a freight train can stop) closer to the factories than to the materials-storage place. Otherwise, the freight train will carry away the materials from the materials-storage place. Don't build factories at the beginning of the game. Use the construction materials from the neighboring cities.

Another point is that the materials-storage place of each station shouldn't be full of materials all the time. If a freight train can't find room to unload construction materials at the station materials-storage place, it will carry them to the next station. If it cannot unload at any stations on the map, the train will carry the materials to the outside.

By the way, if two stations are around 15 blocks apart, it is better to put the materials-storage place at the middle of the two stations, so that you can build properties around either.

Q. Are stocks profitable?

- A. They can be, but you must be vigilant in checking their fluctuations in order to sell them at a higher price than they were bought. (But we needn't mention that to you financial wizards.) Keep in mind that there is a charge for buying stocks that is independent of the stock price. It is calculated by the following formula:

number of shares x 10+50 dollars.

For example, in order to buy 100 600-dollar stocks, you have to pay a charge of 1,050 dollars plus the 6,000 dollar stock price for a total of 7,050 dollars.

In order to gain a big profit, keep records of stock prices on the same day of a week for some time. You'll find that the stock price rises or drops periodically. Seize your moment to buy stocks when their price drops, and sell them when the price rises. If you miss your moment, just wait until the following period. Don't invest so heavily that a crash will bankrupt you.

Q. What part do roads play in the game?

- A. When a road is built by the program, the price of the land along both sides of the road will increase. Land prices around intersections become particularly dear. If you already have land there, you won't be driving a Yugo.

The roads also have an effect on the city development. Before the simulation puts roads in place, small streets are developed only in front of the stations and along the tracks. When an urban road is built, tributary streets will be constructed along the road, promoting full city expansion—sky-scraping buildings. Remember that these larger urban roads appear only if you

build the large stations. Although these stations are expensive, they have a positive effect on long-term development.

There is a big population flow in the area of an intersection, and large buildings will be constructed there by the simulation with ease. If there aren't any buildings around the intersection, it's advisable to construct large lease buildings and commercial properties to prod the program to build.

Q. How do I expand my tracks over land with outside owners?

- A. When you want to extend the railroad, some buildings owned by others may be in the way. You can sometimes buy the buildings using the BUY command in the SUBSIDIARIES window, but they aren't always available for sale.

The above method is expensive, however. If you know from the outset that you want to extend your railroad empire, buy the land early in the game, when it's cheap.

Q. What are the best methods to enlarge the city?

- A. There are several stages in the city development process. Each stage has its own features. Let's explain from the beginning of the game:

After starting the game, build stations, lay lines and run your trains. In a while, the construction materials stored near the station will gradually decrease, because they are used by the program to build residences both nearby and, depending on city form, at a distance from the station. To speed up the city development, it is better early on to construct several lease buildings and apartments around the station. Your station passengers will consequently increase.

At this stage, residences will be built on the cleared land rather than the "green land," such as woods and fields. You must first purchase the green land in order to develop it. Once purchased, it turns into cleared land. If you sell it, residences will soon be built there, furthering development.

Then you can build the larger stations. By doing so, roads extend from the stations, and passengers gradually increase. In turn, residences and buildings are constructed quickly, and the construction of tall buildings begins. Your map will begin to

resettle a true city. But keep a vigilant eye on your construction materials—if they run out, progress will cease.

After the roads have stretched, a number of buildings have been built, and large buildings encircle the station, the city development might stop. If this occurs, just construct several lease buildings on any open places near stations and on both sides of the roads. Cranes will appear around the new buildings, which are then built taller. Selling your buildings now can also promote additional development, pushing your city scale towards success.

Building commercial properties, stadiums and amusement parks has a positive effect on the increase of passengers, and in turn on the city development. Construct such facilities near stations or roads, while considering the "balance" of the map.

With various buildings being put up, you might have a dry cash flow, and some buildings might not moisten your profits. It's advisable to sell those buildings. Try and drop the unproductive facilities and buy buildings which will stimulate the city development. Note also that when you sell many buildings and you make a bunch of dough, you'll get socked with that old capital gains tax.

If there are still undeveloped areas between stations, build a large station. The simulation will produce more growth around the station, and also extend the road. If two stations are too close, move one station to any place which can still be developed.

Q. What do I do if I can't pay my taxes?

- A. Pack your bags, I suppose. If you cannot pay taxes, your company goes bankrupt, and you can go do the laundry you've been neglecting. Note that you have to pay a 50% tax on your profits and 5% on your assets. Your taxes are estimated on March 31 every year. To keep the tax lower, you should invest cash in assets—buy properties and facilities—before March 31. This is *extremely* important to the development of your company. Different branches of your operation are taxed differently.

For the railroad branch, don't worry much about the tax. Once the initial huge investments have been put into the stations and railroads, the railroad branch has only to spend a little money for maintenance. As passengers increase, your railroad's earnings will stabilize.

For the subsidiary companies (including hotels and stadiums), income depends on a cliché—location, location, location. Compared with the railroad branch, these subsidiary companies have a higher initial growth rate. There is, however, a tendency for the sales to stop growing after a period of years. Try and recognize these trends and keep a balance between taxes on your assets and your profits by buying and selling at favorable times.

For the real estate business, it's easy to handle the tax problem. In the game, the factors that determine land prices are very clear. You can directly control land prices, or predict their price fluctuations when you don't control the prices. For example, after you have bought "green" land and laid new lines, the land price soon increases. Be aware that if you sell the land at that higher price, that will provide only a short-term profit. It's better to keep the land and build company facilities. That way, you don't have to spend money to buy the land when you want to build some facilities, and any income from your properties might also cover the property tax. Use this strategy for long-term profit.

In summary, run subsidiary companies for a short-term (10 years) profit, the railroad branch for a middle-term (50 years) profit, and the real estate business for a long-term (100 years) profit.

Q. What powers the Bullet Trains and how do they affect game play?

- A. The Shinkansen is driven by electricity. In Map One, the Bullets will run from top to bottom on the left side of the map when the city's population exceeds 64,000 and there is a certain level of development. On other maps, the population may vary.

The Bullet Trains don't help you play the game, but they have a dramatic effect on land prices. When the line is being laid for Shinkansen, the land price will greatly increase.

Q. What are those flying objects I occasionally see on the maps?

- A. Depending on the map, and what you've had for dinner, there are some interesting items in the skies. During the night of December 24, Santa Claus is flying across the map. UFOs may

appear on summer nights, and there are firework shows on Saturday nights in August at the amusement parks.

Q. Can I build a railroad on a place occupied by buildings?

A. If the buildings are higher than five stories, no, unless they are available for sale in the SUBSIDIARIES window. You can lay track over buildings less than that height.

Q. Why is my income so small after building an amusement park?

A. The first reason may be that there is no station nearby. Another possibility is that the town is so small that few people come to the amusement park on weekdays.

Q. Why are my trains delayed?

A. There are several possibilities. First, there simply may be too many trains running on the line. Second, low-speed trains as well as high-speed trains can run on the same line, causing irregular stops and starts. Third, there may be a conflict with the settings for switches and departure times. Compare schedules for each train on the same lines.

Q. Will two trains have a head-on collision?

A. No, they'll just gently butt heads. The trains stop running when a smashup seems inevitable. A "collided" message will appear in the train status message window. Remove one of your trains or change its moving direction.

Q. What are the consequences of two stations too close to one another?

A. Passengers for the two stations will decrease. However, if you emphasize development around the stations, you can adjust your passenger totals upward.

Q. How are bridges built?

A. The angle between the bridge and the river must be a right angle. The track must also cross the river in a single block on the map. You can't build a curved bridge.

Q. When will I get the "special income?"

A. Stock dividends are paid on July 1, and your bank interest on the 24th of every month.

Q. What are some details of my railroad company income?

A. The income of the railroad company consists of railroad fares, tenant rent from station buildings, fees for client advertising on the trains and the proceeds from stores connected with the station.

The railroad fares depend on the passenger numbers and the travel distance. Long-distance travel with express fare or special express fare plus seat-reservation charges gains a higher profit than the short-distance trips. A high-speed train is more profitable than a low-speed train.

The tenant rent depends upon the number of large stations. The advertisement charges are determined by the number of trains in operation. The proceeds of stores are proportional to the number of passengers.

Q. Why are subsidiary companies occasionally unavailable for purchase?

A. Either your company has already reached the 60-facility limit, or the company is not for sale. Also, when your operation has too many of the same facility, that kind of facility can no longer be purchased. The individual subsidiary limit is 18.

Q. Why do construction materials pile up near the factory?

A. There's no station nearby. Otherwise, the construction materials would be carried away. Your factory won't have any income if the materials can't be transported to other places for use.

Q. Is a train's direction related to its speed?

A. No. The train runs at the same speed after it has reversed its direction at the end of a line.

Train Nicknames

Bent, Zigzag and Crooked (Bellaire, Zanesville & Cincinnati)

Big Suitcase (Grand Trunk)

Bumpy, Rocky and Peculiar (Buffalo, Rochester & Pittsburgh)

Cheapest, Best and Quickest (Chicago, Burlington & Quincy)

Cold, Hungry and Dry (Cincinnati, Hamilton & Dayton)

Damned Small Salaries and Abuse (Duluth, South Shore
& Atlantic)

Hell Either Way You Take It (Houston, East & West Texas)

Hoboes and Tin Cans (Houston & Texas Central)

Hoot, Toot & Whistle (Hoosac Tunnel & Wilmington)

Leave Early and Walk (Lake Erie & Western)

Less Sleep and More Speed (Lake Shore & Michigan Southern)

Old and Weary (New York, Ontario & Western)

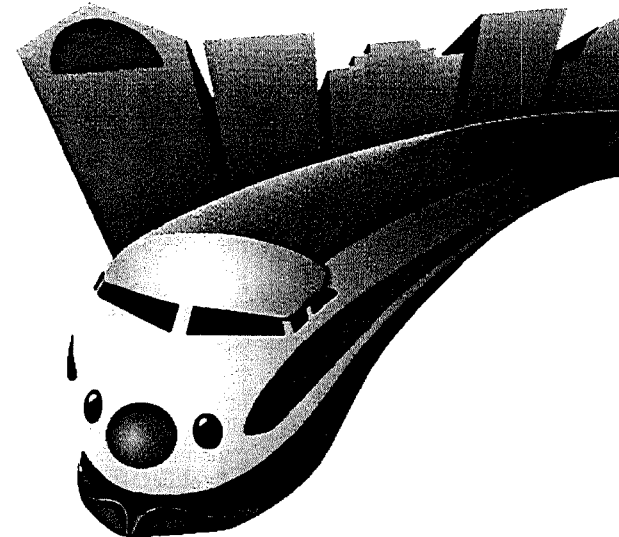
To Hell and Back (Toronto, Hamilton & Buffalo)

Watch Very Carefully and Proceed (West Virginia Central
& Pittsburgh)

From the Encyclopedia of North American Railroading, Freeman Hubbard, McGraw-Hill, 1981

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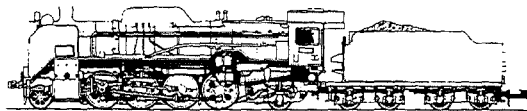
*My heart is warm with the friends I make,
And better friends I'll not be knowing;
Yet there isn't a train I wouldn't take,
No matter where it's going.*

— Edna St. Vincent Millay

IN THE BEGINNING THERE WAS STEAM...

The train has a near-mythic stature in American culture, a legacy of memory that is resistant to the technical advances and demands of transportation today. Though it's more likely that a computer rather than a conductor will inform a modern traveler's passage, talk of trains still prompts images of powerful steamers booming over mountain passes, or of white-coated Pullman porters practicing sleight-of-hand with the silverware.

The train's role in the canvassing of this country was pivotal: planes and satellites have made it a much smaller world, but in the 1830s, the infancy of the train, the country was immense, much of it still mysterious and unknown. The trains that first cut West brought glimpses of a New World to goggle-eyed passengers, and then transformed that world, as new cities and industries sprang up in the wake of the Gods of Iron. Trains were blood vessels that delivered the energy—the people—to animate the body of commerce. But if its whistle signaled the dawning of industrial society, the train also heralded the freedom of mobility and the spirit of adventure, immortalized in songs about John Henry and Casey Jones. The presidential whistle stop has given way to the satellite broadcast, and now it's only on television that we'll see the James Gang, but trains will forever ignite our collective memories.



D51 Steam Locomotive

The steam locomotive scorched its imprint on the land and on the landscape of the imagination. Vivid, tangible expressions of power and speed, the engines impressed as things majestic, almost *ordained*, entities with a purposeful, inexorable path. Their

shrieks, throbs, whistles, hisses, and wails—a symphony of steel—were more that of a living beast than a machine. From the stately dominion of the engine to the charming curiosity of the caboose they were working monuments, and for many lucky people of an era sadly passed, the accelerating rumble of the long coach presaged adventure far, far away. These trains provided an emotional connection to the lay of the land; the great observation cars allowed a traveler to see the living face, the skin of the country.

Trains themselves could be said to have had *two* faces: the grandeur of the locomotive, the thrill of travel, the luxurious dining, the snug berths, the bustling, palatial stations—this was the romance of the rails. The bodies of dead Chinese laborers, the missing fingers of the

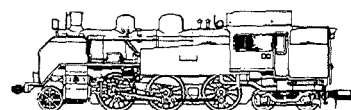
brakemen, the 15-hour workdays, the losses of life in spectacular crashes, the greed of the robber barons—this was the reality of the rails. This blend of happiness and hardship is the singular story of steam's early days, and to understand its story is to understand a formative part of our country's story.

THE B&O BLOWS ITS STACK

In the 1820s, two Baltimore merchants, Philip Thomas and George Brown, investigated England's railways to prepare a local effort to restore Baltimore trade lost to steamboats. In 1827 they secured the charter for the first common carrier railroad built in the United States, the Baltimore and Ohio (B&O), and opened a 13-mile line in 1830. The B&O's first passenger coach was the *Flying Dutchman*, an open car propelled by a horse-powered treadmill. The railway also tried sail power and then stagecoach-type cars, but the line's expansion demanded a more potent form of motive power. To that point, America's only steam locomotive had been the experimental unit designed and constructed in 1825 on the New Jersey estate of Colonel John Stevens, an inventor, steamboat builder and railroad promoter. The B&O commissioned the first commercial steam-powered locomotive built in the country, the *Tom Thumb*, which did proud toil for the railway until the manufacture of the coalburning *York*, a 30-mph train that provided regular passenger service for the developing line. The B&O successfully moved into several neighboring states: Samuel Morse's first telegram, "What hath God wrought," was sent along the B&O right-of-way between Baltimore and Washington in 1843. (The telegraph later proved especially useful for train dispatching.)

The steam locomotive was a regular feature of the mid-century landscape in the populous areas of the U.S. Competing railroads spurred the development of more powerful locomotives and worthier rolling stock, prompting better shipping practices and revenues, and fueling the industry boom. A complex web of commerce was spun from these successes, with new lines fertilizing burgeoning rail towns and industrial production, and these in turn making more market demands on the railroads. The pennies placed on the rails by eager children weren't the only monies being minted by the mushrooming industry—some early railroads even issued their own currency.

The government granted huge tracts of land to the railroads, such as the first land grant of 3,600,000 acres given to the Illinois Central (IC) in 1851. The presence of the rails ensured sales of adjacent land



C11 Steam Locomotive

by the government to settlers. The subsequent development and the mandate compelling the lines to haul government freight at low prices benefited, to some degree, the railroads, the government, and the settlers. The railroads solicited thousands of men, many from Ireland, Norway and Germany, to build the rails that pushed deeper into the continent.

GO WEST, YOUNG TRAIN

In the West, Sacramento merchants Collis Huntington, Leland Stanford, Charles Crocker and Mark Hopkins (the "Big Four," said to own California) orchestrated the building of the western end of the nation's first transcontinental railroad, the Central Pacific, which met the rails of the Union Pacific at Promontory, Utah on May 10, 1869. The raucous celebration at the driving of the Golden Spike that united the two concerns belied the incredible years of hardship and the mammoth feats of engineering required to cross the Great Plains and the Continental Divide. The line was built on the aching backs of Chinese laborers and by gangs of tough men accompanied by temporary tent camps of vice—called "hell on wheels"—that supplied liquor, gambling and fancy women.

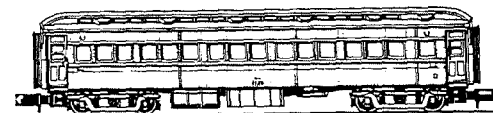
Ralph Waldo Emerson took a visionary approach to the encroachment of the steam train. His words limn the wide open nature of the West itself:

Lucky for us, now that steam has narrowed the Atlantic to a strait, the nervous, rocky West is intruding a new and continental element into the national mind, and we shall yet have an American genius.... It is the country of the Future.... It is a country of beginnings, of projects, of designs, of expectations.

The push West contributed to the decimation of the buffalo, as the Union Pacific hired Buffalo Bill Cody to supply 25 buffalo hindquarters a day to feed construction workers; other lines sponsored excursion trains for "sportsmen" to slaughter the once-ubiquitous beasts. Railroads offered more direct infamies to the Native Americans: the drive West drove many of the original inhabitants off their ancestral lands. Many nefarious dealings underwrote the building of railroad empires. Base financial juggling by railroad financiers like J. P. Morgan, Cornelius "The public be damned!" Vanderbilt, "Jubilee" Jim Fisk and Jay Gould (of whom it was said, "His touch is death,") caused financial panic and stock market crises in the 1860s and 1870s.

The rails were of strategic interest in the Civil War; they were used by both sides in large troop movements, and were dramatic victims of sabotage in both sides' effort to thwart those movements. National drama on another mournful note was the public outpouring of grief that followed the Lincoln Funeral Train, which carried the body of the slain president in a slow procession from Washington to his old Springfield, Illinois home. The black-draped cars, the flower-strewn tracks, the gatherings of the mourners and the curious—all were witness to death's dark dignity in the measured passage of the train.

The Lincoln funeral train provided George Pullman with an opportunity to display the prototype effort of the handsome sleeping cars that would bear his name. Pullman's first newly built car, the strikingly appointed *Pioneer*, was coupled onto the train for the exclusive use of Mrs. Lincoln's party on the last leg of the trip. Pullman was the originator of the "hotel on wheels" concept, a notion that the public soon regarded as a travel essential, particularly for transcontinental service. His company town, Pullman, Illinois, was the site of one the first events of the American labor movement in 1893. There, Eugene Debs orchestrated a failed strike of the American Railway Union, whose members were protesting harsh wage cuts in the Pullman shops. This incident prompted the blacklisting of many of the strikers by railroad management.

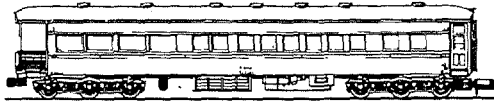


31 Series Passenger Car

CHARIOTS OF THE RODS

The perfecting of the Pullman design was the herald of a lavish era in railroading. Extravagant "varnish" trains like the Southern Pacific's *Sunset Limited*, "the last word in elegance," linked New Orleans and San Francisco in the rococo livery of a first-class hotel: ornate chandeliers, brass cuspidors, maids in the ladies' washroom, and costly dinners with French wines made the traveler feel like royalty. The phrase "red carpet treatment" was coined by the practice of the New York Central's *20th Century Limited* of rolling out the red carpet for its arriving passengers. Services on its New York–Chicago route included a library, a stenographer, a barbershop, showers and incredible dining facilities. The *Panama Limited* served over 20 name brands of bourbon alone. And note this menu from the Santa Fe's *Super Chief*: Guaymas shrimp, limestone lettuce, out-of-season strawberries, Cranshaw melon, Rocky Mountain trout, Westphalia hams, Mexican quail in aspic, fresh caviar, and rare cheeses from France and Holland, with Dom Perignon to chase the caboose. Those were fabulous, if fattening, times.

Passengers were not the only cargo that partook of the luxury of the locomotive—freight service had high style as well, though some commodities were given more attention than others. Trains carrying silk (“the emperor of trains”) were highly profitable and highly competitive in the early twentieth century. Silk runs were continuous runs of thousands of miles on very fast trains, with costly insurance and unusually stringent safety practices to protect against smoke staining and damage to the exceedingly perishable treasure. Because of the fluctuations in the commodity trading markets, a few hours’ delivery difference could be worth a fortune.



44 Series Passenger Car

Some of the trains even carried religion. Chapel cars with organ, pews, parsonage, kitchen and seating for 100 roamed the West, dispensing the Word to remote areas around the turn of the century, hauled for free by the railroads.

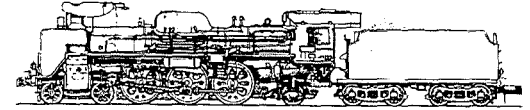
Bibles were standard equipment in the coaches and passenger stations of many nineteenth-century railroads. Of course, not all who observed the incursion of the train thought that rails and righteousness made good company. Here are some notes from a Board of Education meeting in Lancaster, Ohio, in 1830:

You are welcome to use the school room to debate all proper questions in, but such things as railroads and telegraphs are impossibilities and rank infidelity. There is nothing in the word of God about them. If God had designated that His intelligent creatures should travel at the frightful speed of 15 miles an hour, He would have foretold it through his holy prophets. It is a device of Satan to lead immortal souls down to Hell.

Having Satan on their side must have given the railroads enough confidence to tamper with Time, since it was a collective decision on the part of the railroads to institute Standard Time. Prior to that adaptation, travelers from Maine to California might have had to change their watch settings 20 times to have the correct train time. In 1883 at the General Time Convention, four zones—Eastern, Central, Mountain and Pacific (and one for eastern Canada)—based on mean sun time were designated, and then adopted by federal, state and local agencies. These zones were not officially mandated by the federal government until the passage of the Standard Time Act in 1918. The strict adherence to time by the railroads was the catalyst for the machining of fine railroad timepieces, large-faced vest- or watch-pocket instruments that with the advent of computer

scheduling (and the departure of vogueness for the vest) have all but disappeared.

Part of the reason for the disappearance of the steam train itself was in the marvelous diversity of design in its heyday. A splendid confusion of locomotive types existed in the century passed, as each line had its preferences and needs for power and polish. The lack of standardization meant expensive maintenance, delay in parts replacement, and engines that performed single functions, like yard switching, but that couldn’t pull freight. Practical concerns aside, the steamers were glories to behold. Locomotives designed by William Mason were said to be “melodies cast and wrought in metal.” Some of these melodies were very *loud*. The largest series of steam locomotives were the Mallets and the “Big Boys” made for Union Pacific, some of which had wheelbases of 117 feet and weighed over 500 tons.

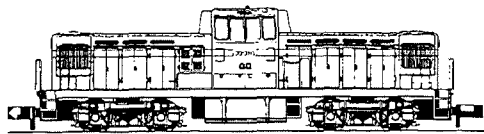


C57 Steam Locomotive

Locomotives of that stature deserved stations of commensurate caliber. The great railway terminals were architectural monuments, such as the St. Louis Union Station, designed to resemble a gateway to a medieval city. Architect Stanford White designed Penn Station in the Roman Doric style; its vast confines included tall colonnades, inner walls of Italian Travertine marble, exterior walls of Milford pink granite, a colossal interior modeled after the baths of the Roman emperor Caracalla, majestic six-foot sandstone statues of eagles, clocks seven feet in diameter, numerous other statues and bas-reliefs, and many graceful embellishments. Built like a cathedral, this magnificent edifice boasted 57 tracks. It was torn down in 1960 in favor of an underground station that now hosts Amtrak commuter trains, the fate also of the fabled Grand Central terminal, which would be a massive, silent mausoleum were it not for its commuter traffic.

DIESEL BURNS AHEAD

The steam train continued to be a formidable presence as the country settled into the twentieth century, but a noise of a different nature was beginning to be heard on the rails. For all their charm and power, the steamers were woefully inefficient converters of raw materials, whether wood or coal, into power. Experiments with internal combustion engines here and on the other side of the Atlantic were promising much larger realizations of potential energy.



DD13 Diesel Locomotive

The proliferation of tanks, cars, trucks and other mechanized vehicles used in World War I prompted a closer look at the internal combustion engine. Dr. Rudolf Diesel, a German scientist, performed the original work on the engine that now bears his name. (Diesel disappeared under suspicious circumstances while crossing the English Channel in 1913.) He demonstrated that the diesel engine could burn a lower grade of fuel than a gasoline burner, producing more horsepower with less maintenance. Germany's 1933 Fliegende Hamburger (dubbed the "Flying Hamburger") train, the first to offer 100 mph passenger-carrying service, gave some credibility to his innovation.

General Electric produced some of the first U.S. commercial locomotive diesels, which were connected to direct-current electrical generators, supplying power to traction motors that moved the vehicles. These first engines were used for switcher locomotives; it was not until the late twenties that truly successful road diesels were employed by the mainlines. Advancements there prompted a revolution. The Electro-Motive Co., a division of General Motors, standardized many aspects of diesel locomotive design in the late thirties and later began to produce general-purpose locomotives that could do yard and road duty as well as various classes of service, unlike the more individual, specialized steam trains. The variance in design of the steamers, part of their appeal, was also part of their demise, compounded by a host of associated problems: coal strikes, labor demands for increased wages, industry price hikes, environmental complaints, and reduced traffic in general. Engineers, brakemen, and firemen, long accustomed to the fiery coal-burners belching smoke and ash, were offered new, unprecedented comforts of operation.

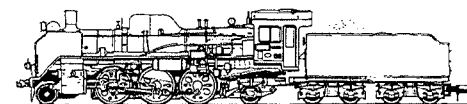
There was style to accompany that comfort as well. The futuristic look of the streamliner train was first widely adopted in the Depression era to promote modern, eye-pleasing esthetics and to speed up train performance. Its principle was based on the observation of a falling drop of water, which elongates in following the line of least resistance, adapting its shape to air friction. Famous designers like Raymond Loewy practiced their fine art on the new form.

STEAM RUNS OUT OF STEAM

The sweet chuff-chuff of the smokestack was a sound dying in the distance. The steam train was yet capable of heroic feats: a steam freighter on the Frisco lines traveled nearly 9700 miles on an endurance run in 1930, virtually nonstop for an entire month, with full tonnage; at one point the freighter was hauling 115 cars. Federal inspection revealed little damage to the engine and no loss of power. Yet, its day had passed; established railroad people resented the intrusion of the diesel, but even the diehards had to get on board.

Diesels were more efficient, operated better under fierce cold, required less maintenance and were more economical than steam. In 1940, only 100 mainline diesels were in service; by the mid-fifties, 90 percent of rail operations were diesel—a technological revolution in only 15 years. The steam train was now on the wrong side of the tracks—the location of the scrap metal yard.

Unfortunately, even with the advent of the diesel, the glory years of the train seemed to be on the wane. Prior to World War II nearly everybody and everything traveled by train because it was the only complete mode of intercity transit. Certainly, Henry Ford's 1914 mass production automobile assembly lines cut into rail use, but the highway systems were not established, and a driver hadn't the assurance of a mechanic at desolate spots on the long-distance road; nor did the airlines offer flights and services to compare with the known security and convenience of the train. The railroads made a huge World War II commitment to haul passengers and freight: millions upon millions of tons of wartime commerce rode from the mines, from the mills, from the wheat fields and the assembly shops, and most tellingly, from the homes of the nation's families, to the ships at sea. The government took over the railroads in both World Wars, forming the U.S. Rail Administration in World War I and the Military Rail Service in World War II. They raised employee wages, hired women in positions traditionally held by men, and supervised the building of tens of thousands of locomotives, both steam and diesel, as well as multitudes of new rolling stock. But the end of the war demarcated a turning point for the train as well.



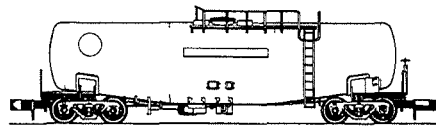
C58 Steam Locomotive

TRAINS LOSE THEIR TRACK

The expanded post-World War II airline services decimated rail passenger service, and the associated costs of maintaining the luxury passenger trains with lower ridership led to cutbacks in customer comfort. Fine observance of the niceties of comfort, long the mainstay of long-distance travel, became more unpredictable, and on occasion, even surly. The automobile was in its ascendancy, and it was to become a ruthless, paradoxical god—worshipped, denounced, but now omnipresent. The passage of the 1956 Interstate Highway Act supported the building of shiny new turnpikes and paved the way for an encompassing national highway grid. Powerful auto industry lobbies and political entities supporting highway expansion made significant noise in Washington, shifting federal interest—and monies—to highways and airports. During the boom days of rail's dominance of shipping lines, railway taxes and Interstate Commerce Commission (ICC) regulations were insignificant barriers to the juggernaut of the locomotive, but new competition and flagging revenues made ICC strictures a stranglehold. Threats from coal pipelines and barges reduced rail traffic further. In the fifties, some of the great names in transcontinental railroading disappeared. By 1970, merely 7% of the population used the rail lines for intercity travel; in 1929 the figure was 77%. Revenues in the West and South were not as palsied as in the huge Northeast Corridor, but clearly, the rails were rotting.

Some mainlines tried new, lightweight trains, but the designs were not carefully executed, and minor fuel savings were not passed on to the customer. The decline of the rails was an international phenomenon—there was partial or full federal subsidization of railway systems in Germany, France, and Great Britain in the 1950s and 1960s; all were in the red due to changing social conditions, technical issues, and transport competition. (France's railways, the biggest fleet in Europe, had nationalized in the 1930s.)

The hideous plight of the 1960s U.S. railroads finally resulted in ICC easings on regulations that had made it difficult to retire inefficient branch-line locals. Some new ideas began to flower. Two transport successes were the "piggyback" TOFC (Trailer on Flat Car) and the COFC (Container On Flat Car), which with their quick loading and unloading and reduction in track sidings simplified and improved shipping practices. The unit train launched a shipping revival. Unit trains are strings of freight cars moving a single commodity, such as coal, between fixed points on a continuous basis,



43000 Freight Car

cutting transportation costs and speeding delivery. These high-volume cars snaked down the rails in shuttle operation of huge mile-long trains of autos and coal. Operations of all type were improved with electronic Centralized Traffic Control (CTC) and new and better third-generation diesels. There seemed to be a late-sixties revival of sorts. Then came the mergers....

UNCLE SAM THE ENGINEER

In 1971, with federal underwriting, the U.S. created a public corporation rail system, Amtrak (the National Railroad Passenger Corporation). In some ways an eleventh-hour attempt to resuscitate the dying intercity passenger train, Amtrak bought the rights to passenger service from the railroads over which it runs Amtrak trains, regulated by federal, state and local agencies. It eliminated duplicated track mileage, unnecessary services and stops and pooled facilities, using economies of scale to cut losses. It is not the speediest of systems, since it must use lines that still carry freight traffic. Amtrak does operate the only high-speed train in the U.S., the Metroliner from Washington, D.C. to New York City, which electrically stings the rails at some points at 125 mph on its 2 1/2-hour jaunt from the beautifully restored Union Station in D.C. There is a five-year Amtrak plan to speed up the Washington-New York-Boston corridor route with a 150-mph Swedish-made train, with tests beginning this year.

Some of Amtrak's routes, particularly in the crowded Northeastern Corridor, are coordinated with airline schedules for traveling ease. Amtrak has operated in the red since its inception, though the ridership (22 million intercity passengers yearly) and revenue numbers have improved. Its chief executive predicts it to be in the black by the end of this decade, and the recent ordering of many new diesel-electric engines and sleepers suggests confidence in the much-maligned organization.

Conrail (Consolidated Rail Corporation) is the result of a government-authorized merger—then the largest corporate reorganization in American history—of several eastern (predominantly freight) railroads in 1976. It is privately managed, but is still struggling financially in its attempt to streamline and improve operations; government funding has endured as a burdensome necessity. Other huge mergers (CSX and Burlington Northern) created even larger consolidations in the 1980s, including manifold companies engaged outside of the railroad business. Canada



15000 Freight Car

also nationalized its rails under VIA Rail Canada, the Canadian equivalent of Amtrak, in 1976. Railroads these days are bewildering amalgamations of underlying companies, predecessor agencies, one-time competitors, paper corporations and the like. These mergers produced all-purpose systems, essentially erasing the functional and geographical distinctions of the great names of railroading. The paper napkin has taken the place of the linen place-setting for most of the transcontinental journeys; the classic "clickety clack" of the tracks is more often the whirring whoosh of a coldly efficient electric interurban.

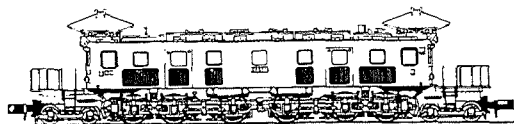
ISING THE TRAIN ELECTRIC

The electric train isn't merely a marvel of the Atomic Age, however. The B&O had a mainline electric (third rail) in Baltimore in 1895, and the New York Central electrified its passenger line in Manhattan in 1908 after a series of steam engine accidents. The Pennsylvania line (PRR) had extensive electrification of its mainline passenger system in the thirties. But the dominant form of long-distance motive power remains the diesel. Within and between the cities, it is a different matter. Actually several matters, since the history of intercity transit is bound by several transportation spines, e.g., the horsecar, the omnibus, the jitney, the trolley, the cable car, the light rail vehicle (LRV) and the rapid transit system (subways or "heavy" rail), and an amalgam of oddities, such as cars propelled by air pressure, chemical reaction and powerful spring motors. Richmond, Virginia had the first trolley system using overhead lines and multiple unit control in 1888 (Frank Sprague's model for those in most major American cities); 150 were built within two years. Seattle still has a working monorail, the only commercial one in the country, but it is essentially a tourist leftover from the 1962 World's Fair. But any digging through urban transit history should begin at the site of the first subway diggings: London.

As befitting one of the world's largest and most prosperous industrial and commercial centers, nineteenth-century London also suffered

from what would be considered a bane of modern life: the traffic jam. One enterprising solution was the building of the world's first subway, the Metropolitan Railway, in 1863, an entity dubbed the "sewer railway" by skeptics. The steam-powered trains carried

9.5 million riders the first year—and its refurbished Baker Street Station is still in use. Laborers' fares on the Metropolitan enabled poorer working-class people better transport, enhancing housing



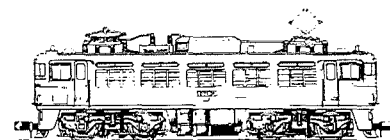
EF57 Electric Locomotive

and job development in outlying districts, and diffusing the congestion in city centers. The first deep-level Tube under the Thames was built in 1890, though there was a pedestrian tunnel—the first tunnel designed for public traffic to be driven beneath a river—functioning in 1843. Considering the tunneling equipment of the day and the lack of precedent, Tube engineer Sir Henry Greathead lived up to his name.

The City and South London Railway built its own generating station (about which H. G. Wells wrote a story called *Lord of the Dynamos*) for the electric Tube trains, a station which at the time was the biggest in the world. The railway was a grand experiment, with all new legal and social precedents. The cars were smelly, uncomfortable, noisy and very rough. They were described as "padded cells" by the upper-crust riders who because of the standard, one-pricing fare were forced to mingle with the hoi polloi. People flocked to the operation, which had myriad breakdowns. A succession of Tubes followed at the turn of the century, and they were used as shelters from the bombing of World War 1. Many of London's buses were commandeered to be used at the Front.

The web of transit routes and types was becoming increasingly complicated, particularly after the physical connection with mainline railways in 1915, with many lines newly electrified to better compete with the Underground and surface traffic. London Transport was created as a supervisory body in 1933 to coordinate above- and below-ground transportation. The government took over operations at the advent of World War II, installing sleeping accommodations in the Tubes, some of which sustained heavy damage. One of them even sheltered Winston Churchill and his War Cabinet during the Blitz period of air raids. Railway machine shops were converted to producing war materiel, including bomber planes.

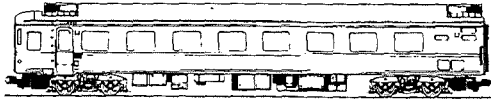
Today, London is a vast, interlaced maze, one of the most complex urban rail systems in the world. Headway between trains on the Underground can be as little as 90 seconds. At one complex of junctions, 1,200 trains pass through at peak hour. There are over 2,000 overland route miles, of which 75% are electrified. The Victoria line, the first fully new underground line in 62 years, is almost wholly automated, with comprehensive signalling and train control systems. The complexities of managing such a system are daunting: current surface transport and Underground conditions are crowded, not absolutely reliable, and irregularly maintained. The reorganized



ED59 Electric Locomotive

London Transport has experimented with fare increases, decreases, discounts, multiple system-use Travelcards, and station modernization. To encourage public transit, they are considering using Electronic Road Pricing, a system to charge motorists fees for using crucial roadways at busy times, with car parks provided at the outskirts. Work is proceeding between transit and computer gurus to produce expert systems—programs that model the decision-making processes made by experts—to automatically manage transit crises: programs to shut down trains, channel people to safety, automatically fight fires, etc. The challenges will continue.

UNDER THE CITY THAT NEVER SLEEPS



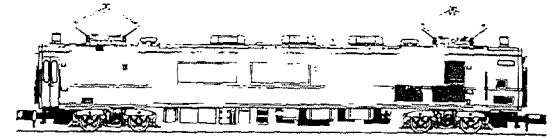
25 Series Passenger Car

To truly appreciate the broad evolution of transit systems through time in this country, New York's resume is mandatory reading. New York had the world's first horse-drawn streetcar (1832), which did yeoman service for the New York and Harlem Railway (NY&H), and America's first rapid transit

network based on the elevated steam railway, which was preceded by elevated cable cars. By the end of the 1870s there were several flourishing lines. So much were they flourishing, that the crushing crowds agitated for the passage of the 1894 Rapid Transit Act and the formation of the Rapid Transit Commission, which provided public monies for construction of the first organized transit system, the Interborough Rapid Transit Company (IRT). In 1904 the IRT introduced the first true wholly underground electric train, which was eventually consolidated with the elevated operations. The subway had over 100 million passengers its first year at 5¢ a head, a price in effect until 1947. (The rate is currently a buck and a quarter.) Those numbers surged to more than two billion in 1930, though today's figures have settled at half that figure.

The deaths of 97 people in the worst subway accident in U.S. history (a train piloted by an inexperienced strike-time employee derailed) in 1918 did little to diminish the success of the IRT. The demands of city density gave birth to expansions, consolidations, and a number of competing private lines. Pullman-designed cars (designated the *Green Hornets*) made their appearance in the mid-thirties. The subways were running 24 hours a day, seven days a week, as they do today. The city was a remarkable concatenation of public transit facilities whose effectuality was severely compromised by a single figure, Robert Moses, to whom is attributed the wholesale capitulation of the New York transit system to the automobile. Holder of multiple commissionships with leverage over 10 city and state

agencies, a powerbroker who held the sway of a succession of mayors, lordship over public works construction, and considerable media influence for 40 years, Moses whored for the auto industry, hammering the transit system with irreversible damages. He is famed for constructing the Long Island Expressway, mocked as the "world's longest parking lot," obsolete the day it opened. After World War II, Moses built two billion dollars worth of roads in New York city alone, few of which served to better the needs of the public. Here is another sad lesson, its effects visible to this day, where the public good is victim to private greed.



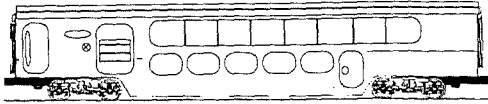
25 300 Series Electric Car

THE FREEWAYS AREN'T FREE

That story is a cautionary tale, which unfortunately had to be told on the other side of the country as well. The Pacific Electric transit system in Los Angeles County is claimed by some transit historians as the "world's greatest electric railway empire." Upgraded from its original turn-of-the-century days of horse- and cable cars, the system connected major Southern California cities, and at the peak of its popularity had over 1,000 miles of track. The line was the result of one man's vision, that of Henry Huntington, nephew of famed Southern Pacific robber baron Collis Huntington. Huntington owned several railways, utilities, and real estate ventures, but from 1898 until the 1940s he concentrated on expanding his metropolitan organization, from the suburbs to the smaller municipalities, with improvements in service, cars, and routes, both freight and passenger. Many lines offered excursions and special junkets with plush furnishings, such as dining cars and observation cars. Hear what William D. Middleton says about the railway in *The Interurban Era*:

Great trains of heavy steel interurbans, their air whistles shrieking hoarsely for road crossings, hurtled at mile-a-minute speeds down the inner rails of the Pacific Electric's four-track steel boulevards, overtaking mundane locals that skipped from stop to stop on the outer tracks.

But as with the railroad, the auto encroached upon the trolley. Both local and federal support leaned heavily towards the auto. The electrics had difficulties securing right-of-way allowances, which cramped schedules and marred the perceived efficiency of the services.



251 Electric Car

The Depression took its toll on faltering branches of the Pacific, and auto industry lobbies and back-room finagling pushed many trolley lines out of business by the end of World War II. General Motors did a comprehensive (and some say conspiratorial) purchase of wobbly lines in 45 U.S. cities, Los Angeles prominent among them, and replaced them with diesel bus routes. The transit agencies lobbied for additional highways, neglected to service the expanding suburbs with trolley lines, and failed to support the obvious need for a subway, dooming L.A. to intolerable levels of foreseeable pollution. Six decades of solid service terminated in the sixties for the electric railways, while freeway production galloped like the Headless Horseman—until today's gridlock misery stopped its internal combustion heart.

Now, The Los Angeles County Transportation Commission (LACTC) is developing five commuter rail lines that will connect downtown L.A. with communities in surrounding counties. They will employ 80-mph diesel trains using the rights of way of existing rail lines, funded by transit sales taxes, bond measures and local funds. In 1990, the L.A. to Long Beach Blue Line began running, hosting electric trains that connect with bus lines (selling combination bus/rail tickets). There are two other lines in development that by completion in the early 21st century will carry hundreds of thousands of people daily from outlying regions. Passengers using both rail transit and commuter rail are expected to exceed 500,000 by as early as 2010. The 150-mile network—funded by state, federal and city monies—will utilize Park and Ride lots, feeder buses and shuttle lines to fill 70-mph trains.

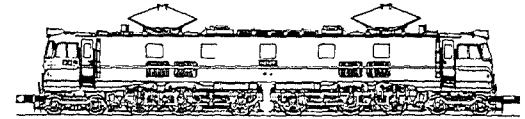
There has been some controversy as well. In early 1992, the LACTC backed down from an agreement to buy 122 million dollars of Japanese railcars under the rising pressure of "Buy American" sentiment, prompted by domestic economic setbacks and the perceived threat of Japanese trade domination. Now there is a proposal to build a railcar plant in Los Angeles to reinvigorate the mass transit industry. The sparks were still flying and the smoky rhetoric too thick to see what the outcome will be.

As it stands, the LACTC's 30-year overview envisions an integrated Metro system embracing options such as freeway carpool lanes, synchronized traffic signals, expanded bus services, and, in cahoots with community businesses, underwriting the showcasing of its 16 Green Line stations as public works of art, hiring individual artists

to provide "theme" designs. After watching the abandonment of a perfectly useful transit system—and savaging the air—good sense took a shallow breath (this is L.A., after all) and spoke up.

This checkered history of interurban transit is unfortunately not confined to our coasts. The incidents of abandonment of working transit systems is not that of random, isolated occurrence, but what appears to be systematic—and spectacular—stupidity. By

1920 almost every sizable American city had a functional rapid transit system based on the streetcar. By 1930 the U.S. had the highest electrified route mileage in the world. Electricity was non-polluting, and at moderate ridership levels, cheaper and more efficient than oil. Yet city after city surrendered its rights of way (and its sense) in favor of the bus or automobile. Seattle had an electric railway between Seattle and Tacoma in 1902, an electric interurban scheme in 1909 and also a cable car system, soon stretching into a complete network, but it was in the main undone by preferential right-of-way treatment to the automobile. Congress allowed Washington D.C.'s extensive electric trolley service to be dismantled in favor of diesel buses, but now its Metro system (after arduous initial delays due to disputes in allocations at the federal level for years) is the most modern, automated subway in the country, completely coordinated with bus and rail routes. It uses Automatic Fare Collection, track geometry cars and ultrasonic rail testing for precise track maintenance, with devices so sensitive to changing conditions that cars can run virtually without operators.



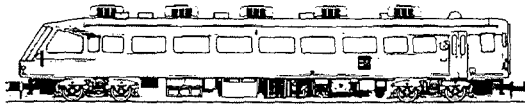
EF58 Electric Locomotive

THE START OF BART

Metro's model was the San Francisco Bay Area Rapid Transit (BART) system, which at the time of its ballot approval in 1962 was the largest single public works project ever undertaken in the U.S. by the local citizenry. Later, cost overruns necessitated state bond funding and federal monies. The first-generation BART cars were built in the early seventies by Rohr, an aerospace-industry firm inexperienced in urban transit projects. (U.S. manufacturers of rail cars are now almost non-existent.) This high-speed (80 mph) electric heavy-rail system was the ultimate in technology, but so new that many of the computer enhancement devices proved unreliable in the first years of use. The building of its 3.6 mile transbay tube—the longest underwater transit tube in the world—was a titanic feat of civil engineering that took six years of seismic studies and over two years to complete. Massive sections of concrete and steel weighing 10,000

tons each were lowered into a huge trench excavated on the floor of San Francisco Bay. Special design provisions were made to make the tube—as deep as 135 feet below the Bay surface—flexible to absorb earthquake shocks. Subway excavations for the downtown stations were rich with buried ships and other memorabilia, from the days when the landfill was open harbor.

Current daily weekday ridership is near 245,000 for its three-county system, and massive increases in ridership followed in the aftermath of the October 1989 earthquake, when many travel options, including the Bay Bridge, were disabled. Ridership revenues fund half of operating costs, which is a fair return for a massive transit system. The average BART car has traveled one million miles since it was placed in service; the new “C” cars were brought into use in the late eighties, and newer designs yet are being implemented.



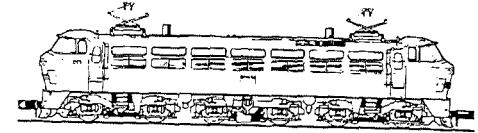
14 700 Series Passenger Car

There are several expansion plans for the 71.5 miles of track, dependent on combinations of federal, state and local funding and public support. With its cable cars, streetcars, BART, diesel and electric buses and ferry services, San Francisco has a diversified and integrated transportation web. San Francisco was the first city in the world with cable cars (1871) and sadly, is now the last. Its Muni was the second (1912) publicly owned streetcar system in the world. Despite the fact that San Francisco, too, abandoned its original transbay rail service on the Bay Bridge (a victim of the Depression and pro-bus lines), it has always been a progressive force, whether in transit or in trendy haircuts. A group of mass transit boosters are promoting the return of rail to the bridge in the form of 70-mph electric light-rail cars to link San Francisco and the East Bay and its regional transit network. The proposal sees ridership of 160,000 passengers a day as a supplement to BART, which sometimes operates at 170 percent of capacity at peak hours. But for now, it's just a proposal. There's still a ways to go: parking places and uncrowded roads in the Bay Area are yet as easy to find as a professional ballplayer satisfied with his salary.

The degree to which public support can influence transit policy is even better illustrated in Toronto, where the majority of surface transport is still accomplished by trolley, supplemented by subway and diesel bus systems. Under the impetus of much give and take between the civic leaders and the public, the Toronto Transit Commission was created, overseeing a commutation web of surface and subway routes. Lines from the turn of the century have merged

with the modern to form the largest streetcar network in North America. The stimulus that rail provides to private development is underscored by the initial \$67 million-dollar investment generating an estimated \$10 billion in assessed valuation along the well-traveled lines. The preservation of electric street railways has only occurred in cities like Toronto, where community action, public ownership and trains on reserved or fully grade-separated tracks has boosted their survival chances.

Communities all over the world have invested in subways and light rail systems, with varying degrees of success. London, Paris, Tokyo and Moscow head the list of biggest and best underground rail systems overseas, and there are examples all through Europe, Asia and Mexico. One Mexico city subway station is built around a genuine Aztec pyramid. Its system uses rubber-tired cars, as do subways in Paris, Buenos Aires and Montreal. Moscow's system, which in 1980 moved more than 1.7 billion passengers, has the largest ridership of all.



EF66 Electric Locomotive

The new interurban rails, with their low centers of gravity, automatic body-coupling systems, and enhanced speed are a far cry from the first interurban trolleys between Minneapolis and St. Paul in 1891. Some of the old interurbans were actual competitors for the luxury trains, with dining service and sleeping cars. When they even began to handle freight, the railroads bought up the lines to maintain their dominance. But with full-crew dining days passed for the interurbans and the transcontinentals, it is the convenience of the computer that lures the passengers. The computer has revolutionized scheduling, with automatic route setting and speed adjustments, and sensors reporting real-time changes in train and track conditions so that some systems have dispensed with attendants entirely. (Many miles have gone by since the days of the “smoke orders” method of identifying clear track ahead. Engineers would presume safe steaming by the absence of another engine's smoke; if the smoke signal was sighted, one train would head for a siding.)

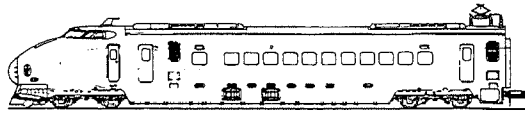
Now there are systems like Vancouver's 13.6-mile SkyTrain, North America's first fully automated transit system, carrying 60,000 daily passengers. Automated guideway transit systems (AGT) are in operation in Japan, France and Miami, with many on the way. Initial technical problems in the seventies have been succeeded by reliable systems. Often of the “peoplesmover” type, a sort of horizontal elevator, the AGTs have low labor costs, run more night and weekend

service, and have a very short headway between trains. The trains are often smaller and more lightweight than normal, with lower operational costs per mile, though land development and initial grade-separation of the track can be expensive.

SPEED THRILLS

But the issue that most spectacularly marks modern train travel is speed. High speed is surely not the only factor that influences train use, but it is significant, and it is glamorous. Some studies have shown a 1% to 2% rise in traffic with a 1% cut in perceived journey time, and though that perception can be coaxed by clever marketing (some high-speed trains do not sustain their top velocity for trip durations), many of the routes are competitive with the airlines for certain distances.

It is overseas that high-speed trains made their name, and there they continue to make the news. In Japan, the incredible population density of the Tokyo-Osaka corridor overwhelmed existing solutions. The concept that seemed most promising was that of an ultra-express electric train, the Shinkansen (New Railway), with a dedicated line, separate from the morass of the rest of the rail network. The design called for a wider, safer gauge and trains with a sleek, distinctive nose—hence, their nickname, the Bullet Trains. The system premiered in 1964, offering regular 125-mph service, though many economic and physical problems ensued. There was a disproportionately higher level of rail deterioration after the 100-mph speed was breached, and some communities vigorously protested the considerable noise of the trains, prompting expensive shielding. These and other environmental regulations made the most expensive railway in the world even more expensive.



222 Shinkansen Electric Car

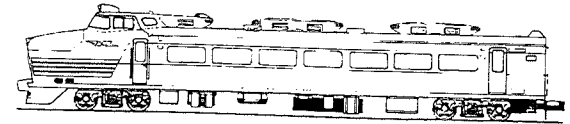
After the start-up problems, considerable new industrial development and housing opened up in the early years of service. Now there are four existing lines, carrying 200 million passengers per year, and others in the works. Three billion passengers have ridden the Shinkansen without an accident-related injury, enjoying its high speed, high capacity and reliability. For distances around 300 miles, public support for Shinkansen travel is considerable—the lines have been quite profitable to date. However, after going deep into the red, the parent body, Japan National Railways (JNR), had to be reorganized in 1987 into six passenger divisions and one freight, making up the Japan Railways Group (JR). The government leases the lines and the

trains to the railroads. A large portion of the debt has been written off by the government; the eventual intention is for the divisions to be wholly private commercial entities.

The Bullets already have automatic speed and braking control, but there are new designs for the track and cars, including some double-deckers. A top speed of around 185 mph has been proposed for commercial service, and the technology is there—the deterrents are mostly environmental. Today's third-generation Shinkansen cars are lighter and more aerodynamic, but the 185-mph trains will be newly developed rolling stock. Many city commuter lines are still so overcrowded that some lines assign workers to push the last few passengers through the doors on holidays and at the daily rush hour.

The success of the Shinkansen has been a great impetus to Great Britain's, Italy's and France's desire to achieve high speed, though Japan's conditions were more favorable for the radical and costly approach of a dedicated line. France's National Railways group, the SNCF (Société Nationale des Chemins de Fer Français) built a high-speed train, the TGV (Train à Grande Vitesse) for its Paris to Lyon route. It carried 5.6 million passengers its first year and had an average speed of 132.7 mph (a record) in 1983. The TGVs have automated signalling and electronic track sensors that evaluate the speed, course and conditions of the train. A series of accidents in the late eighties was the catalyst for new signalling systems to produce "intelligent trains," using radio communication between on-board microprocessors and central control to compute a train's speed and establish its location to an accuracy of $\pm 0.1\%$. Anticipated linkage to heavily traveled existing rail systems will provide the basis for a core network of TGVs over much of northern Europe. This plan implements moderate construction of the new track with strategic links to upgrade 75% of all French rail services. The scheme already has branches into Belgium, the Netherlands and Germany.

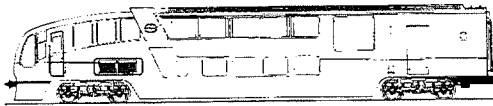
The SNCF does have some management autonomy in setting rates and schedules, but there is heavy state involvement in planning and subsidization. The Sud-Est line has been consistently profitable since 1984, with overall passenger journeys on TGV lines rising as of 1988 (around 50 million total passengers for SNCF). The trains continue to operate the world's fastest nonstop schedules; the TGV Atlantique runs at 185 mph, but that speed is not sustained for all



181 Electric Car

routes. In May of 1990 a specially outfitted TGV train achieved 320 mph, an occasion that brought SNCF's president, President Jacques Fournier, to declare that "The TGV still harbors remarkable potential—the limit of wheel-rail technology was not reached...." These speed successes have brought proposals to run commercial routes at 220 mph. The SNCF operates sundry other diesel and electric lines, but it is these air-slicing speed machines that grab the headlines and the heartbeats.

In Great Britain, speed has taken a different flavor. The Railway Technical Center was expressly built in 1964 to use the scientific method to investigate wheel/rail dynamics and car design for the production of high-speed trains. Full-scale experimentation involving heavy calculation, modeling, simulation, and laboratory work produced the Advanced Passenger Train (APT) in the early seventies, a 150-mph electric with aerodynamic design, lightweight construction, and carefully researched advances in braking, suspension and car-body tilt. However, advances in design often require radical entrenchment, such as the replacement of existing lines, cars, and more daunting, replacement of existing psychologies, which occasionally view innovation with distrust. This was a case where the engineers were able to fashion extremely effective new systems, but their implementation was partially thwarted by the research jealousies and divided attitudes in Great Britain's railway industry. Market changes and technical problems as well as these contentions endemic to innovation kept the APT out of regular use until the mid-eighties, considerably changed from its original prototype, and with its development team and plan totally reorganized.



250 Series Electric Car

The APT's story speaks of the burden of collaboration and compromise in negotiating between commercial needs, scientific progress, and human temperaments. Apparently, the political climate was not suited

for the macrocosmic change of the first APTs. However, improvements in diesel mechanics, with some implementing of APT research knowledge, was the impetus for the High Speed Train (HST), a 125-mph locomotive that has brought pride to the InterCity division of British Railways (BR) passenger service. Less specialized and more adaptable to changing market conditions, the HST is a new approach to high performance. It is expensive to operate, but is the centerpiece of the "flagship marketing" of British Rail.

THE PULL OF THE MAGNET

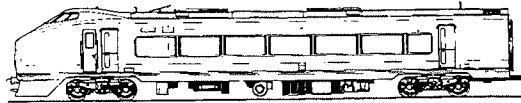
In the U.S., the Department of Transportation maintains nine miles of electrified track at its High Speed Ground Test Center in Pueblo, CO where existing and future transit methods are probed for advantages and disadvantages. There is a High-Speed Rail Association in Washington, D.C. interested in those probings. Its alliance of vendors, planners, consultants, civil engineering firms and real estate interests are searching for sites and situations to promote the use of high-speed railways. One long-discussed site is the open desert landscape between Los Angeles and Las Vegas, for which a number of companies have proposed express methods to quickly part gamblers and their money. Besides electric and diesel proposals, there is a consortium promoting magnetic levitation ("maglev") trains as the optimal solution. Maglev is a contact-free system using electromagnetic forces produced by superconductor magnets for levitation, guidance and propulsion. Support magnets draw the vehicle toward the guideway from below and guidance magnets hold it laterally in place. Extremely sensitive sensors ensure a constant gap of approximately one-half inch between vehicle and guideway. By reversing the poles of the magnetic field, the driving force turns into braking power. The active parts of Maglev's drive system are installed directly in the guideway, making the vehicle lighter and less complicated. The trains can skim the air at speeds up to 300 mph. Environmentally sound (though loud) and able to climb steep gradients, the trains are a promising transit instrument. Japan is considering installing one on its Tokyo-Osaka run and Germany has done extensive experimentation with the technology.

The downside is that initial startup costs are tremendous and don't justify placement where existing routes are adequate. A well-developed transit infrastructure prevents emergence of a rival product like maglev, unless there is enough traffic to justify its prohibitive costs. These costs might be more reasonable over long distances (1000 miles) considering time saved by the trains' speed, but it is a huge marketing risk, and air competition probably obviates its use. Also, the effects of the superconductive magnets on humans must be deeply researched. This may be an example of an advanced technology whose economics and performance make it more sensible to improve older systems. Maglev might end up like the tracked hovercraft of Great Britain, an experimental option of the seventies that came down to earth. However, preparation has begun for a Florida maglev line opening in 1995 to rocket 14 miles from the Orlando airport to Disney World in 250-mph+ German-made trains. The contract was awarded to Transit Inc., an American-Japanese-German consortium.

If that venture is successful, we might see more small-scale lines develop. Or maybe we'll go back to sail-powered trains. It's a funny world.

THE EUROPEAN NETWORK

Apart from the very specialized concerns of maglev, a host of overseas countries are entering into a series of unprecedented agreements and strategies that will link all of Europe in a grand loop of transit unity. In the fifties the Trans Europe Express (TEE) cars linked 70 centers of European commerce, but the compact was victimized by interorganizational and intercountry disagreement that made its use negligible. In 1987, the authorities of the national railways of the European Economic Community members, together with those of Austria and Switzerland, formed a body known as the Community of European Railways to develop strategies for high-speed rail linkage throughout the continent. With the advent of true free-market conditions in 1993, the possibility of a single, interconnected transport market is a reality. The momentum of unity is driving the Channel Tunnel (the "Chunnel"), the advance of the Paris-London and Paris/Brussels/Amsterdam/Cologne connection projects, and the upgradings of rolling stock and new transit operations in virtually all of the nations. The momentum has sputtered a bit of late, however; there has been some hedging on the part of E.C. members on some provisions of the common-market Maastricht treaty, particularly on the issue of a single, unified currency by 1999. However, much of the unification news is positive and progressive.



650 Series Electric Car

It can be incontrovertibly demonstrated that the existence or non-existence of an integrated railway framework can influence the character of cities and countries as much as their geography.

All countries could enjoy significant advantages in terms of industrial development, employment, safety and the environment, as well as strengthening the political and social ties that bind societies together. The Chunnel is well along in its construction, and promises by mid-1993 to link London and Paris and London and Brussels in about two hours. Another continent looking for a rapid rail complex is Australia, negotiating the construction of a 220-mph train between Sydney, Canberra and Melbourne—at a cost of \$5 billion—to be operational in 1997.

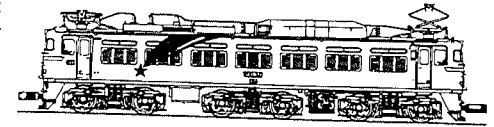
AUTO NEUROTICA

Which brings us back to the automobile, which has more recently influenced our cities and culture in a more significant way—unfortunately, not altogether a positive one. Our culture is structurally infatuated with the automobile, exemplified by continued federal subsidization of highway construction and gasoline prices in the face of increasing environmental threat and damage. I admit complicity in this conspiracy against sanity, having more love for a '62 Cadillac than for any train. America has 5% of the world's population yet uses 30% of its energy supplies. It's been said that gasoline addiction is the least recognized and most prevalent form of substance abuse in America. The result of that addiction is the atrocity that substitutes for air above Mexico City and Los Angeles—a foreseeable, preventable problem, but a problem fueled by combinations of ignorance, deception and greed. The U.S. abandoned passenger trains in the forties while they were still effective and useful in favor of new technologies like the airlines and the auto. For many transit needs, the new technologies were no more effective, and in some regards, actually destructive.

Autos and auto-related industries crowd cities; some cities have three or four private vehicles per one legal parking place. This state of affairs has made "rush hour" (perhaps more aptly, "crush hour") the most dreaded of phrases. The train is an elegant, flexible solution to the fixity of gridlock—

it can be lengthened, shortened and rescheduled to meet specific demands. If volume justifies, it can even address the new mobility, our flight to the suburbs, by extensions of its lines. A transit system can even unify a city, providing for at least a modicum of democratizing social intercourse between young and old, rich and poor, and black and white.

The development pattern for national urban settlement—urban cores of moderately high densities compactly arranged within walking distance of the streetcar lines and of the nearby suburbs—was shaped from 1880 to 1920. There were no transit systems at first; there was the Dickensian squalor and overcrowding of London and New York. The streetcar helped shape new spatial organizations. Chicago is an example of a city that has integrated and expanded its transit service as times changed. It was the first U.S. city to electrify its elevated railways (1895) and much of the structure, though greatly modernized, is still used. Its heavily trafficked Loop is host to a large commuter rail service (the only one outside New York with



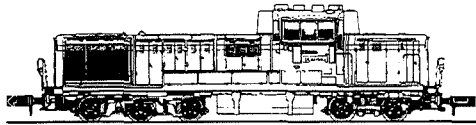
EF81 Electric Locomotive

bar cars), fed by rapid transit utilizing its rights of way on median strips on the highways. The system is cited as one of the best in the nation, yet the majority of the population now live and work in the suburbs, a need not adequately addressed by today's options.

As the growth of cities is shaped by the development of their transportation facilities, the evolution of transportation technologies is vital. The symbiosis is easily put out of step, as the ability to foresee transit needs for swiftly changing growth patterns (and predictable behavior patterns in regards the *using* of transit) can lag behind the technology. Or failure in the organization of a project can be the hidden cause of "technical" problems. Inhibitions to publicly beneficial transit systems have run the gamut from public mistrust, incompetence, and ignorance to deliberate obstruction and malfeasance—immorality in the face of profit.

RAILROADS CRY UNCLE (SAM)

Railroads were originally created with private capital for private gain. Railways in most countries today, even those under private ownership, are subject to state control and political pressure. Partially this is because they are viewed as a "transport service to the nation," not just as an industry that can be judged purely in terms of an internal profit or loss. Modern railroads are regarded as part of the infrastructure of advanced countries, thus government, acting on behalf of the people as a whole, has contributed towards the running of passenger services that could never cover their full expenses out of revenue.



DE10 Diesel Locomotive

However, government support in this and other industrialized countries has leaned to auto industries to promote jobs and boost economies, though job opportunities in the transit industry are considerable, and social concerns like the environment are better served by mass transit.

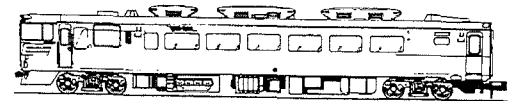
Transit systems are seen in a bad light by analyses that simply assess benefits and costs involved in a mass transit investment, rather than by a method which employs broad social and economic overviews. The losses at which rails often operate often serve a larger good, but without alert support from public and private concerns, a community's transit options are unknown, subject to manipulation by profiteers of competing industries.

The public can also declare some rather contradictory ideas about transit. A 1991 survey of 1,100 California drivers found that 75% of

them supported more public funding for mass transit and ride sharing, yet less than 25% showed a willingness to consider ride sharing, carpools, vans or minibuses to get to work *themselves*. And nearly 85% wanted improved and expanded roads for automobiles. People squawk loudly when their pocket is pinched: 65% opposed increased parking fees.

Here are some generalizations about transit system forms: Commuter rail is relatively high-speed and capacity, operating over existing mainline railroads for long-distance mass transportation. Heavy rail is high-speed and capacity, running 100% passenger trains on separate transit tracks. With sufficient volume, heavy rail has lower operating costs per passenger than any other system. Estimates vary, but some analysts warrant that a highway at peak capacity moves 1,500 cars per hour, but that hour on a heavy rail track could potentially service between 40,000 and 50,000 people. And its systems—from electronic fare collection to computer sensing to railcars—are available "off the shelf." Light rail can operate on surface streets, subways, elevateds, rail branch lines, and expressway medians, sometimes owning its own right of way, sometimes sharing it. For small- and medium-size cities where passenger volume cannot justify heavy rail, light rail is an energy-efficient, economical alternative. Heavy rail is uniquely qualified to operate in high-volume traffic corridors, but strategic connections to major suburban areas can make it feasible in the modern "polycentric" city, one with multiple "city centers." Rail line building also has a minimal "footprint" when compared with expressways: for equal carrying capacity, the ratio can be as little as 24 feet wide for rail as opposed to a 300-foot wide highway—and is much less energy intensive to build. Studies show that a daily 7,000 passenger-miles per line-mile will support the building of light rail, 24,000 passenger-miles per line-mile for tunneled rapid transit. Peoplemovers (ACTs) are expensive to build, and usually found only in large urban zones.

There is a spate of interrelated complexities that determine the suitability of a community for a transit system. Some European communities as small as 200,000 have LRV systems. Almost any city with 500,000 or more can justify a full network, but population distributions (distances from city center, suburban densities), not population alone, are critical. The size of the Central Business District (CBD), the amount of the downtown non-residential floorspace, and the number of and distance between stations all are factors. Some cities have expanded



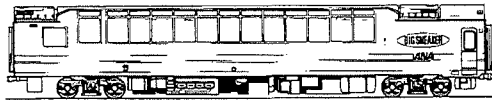
82 Series Diesel Car

or implemented their rail transit on existing lines and rights of way, lowering costs. Surveys have shown that Park and Ride lots increase the distances people travel to use the service, as well as increase the number of radial lines that enter it. Earlier studies have shown that 70% to 85% of rail transit trips in the U.S. occur between a residential corridor and a downtown, but these factors are all city-specific, thus greatly variant.

In many typical metropolitan areas today, suburb-to-suburb work trips now outnumber the conventional suburb-to-downtown commutes. Many communities are looking to establish intersuburban, or circumferential, transit lines, using old bypass or industrial belt railway lines in once-rural areas that are now bustling suburbs. Planners in New Jersey, Maryland, Philadelphia, Chicago and Southern California all have strategies in various stages to implement peripheral rail routes, either on unused freight lines or on a shared basis with active shipping.

A PITCH FOR RAIL

Rail systems economize on land resource conservation by eliminating unneeded downtown parking, and they gain related savings for streets, sewers, water lines, electricity, gas and telephone connections, easing private and government expenses that serve and support auto traffic. Transit ridership per resident is four to five times higher in "rail region" areas of rapid transit than in "bus-only areas"; urban rail travel does not displace bus travel, but gains ridership at the expense of autos. The electrical motor has greater losses in power conversion from the primary energy source than the diesel engine, but if the generating plants are clean and efficient, passenger volumes insure greater overall energy savings than that of the bus and the auto. At even moderate volumes of service, rail energy consumption is lower than that of diesel buses. The oil crisis of 1973 prompted many countries to convert all public rail traffic to electricity, often with government subsidy.



83 Series Diesel Car

Also at moderate volumes of traffic, light and heavy rail operations save on labor costs when compared to alternate systems like buses. Models built on the number of trips to move equal numbers of passengers demonstrate that

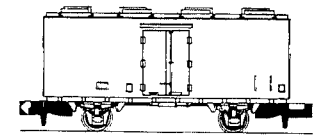
the total output in place-miles per driver considerably favors mass transit. High volumes of bus use usually indicate higher urban densities, thus lower bus speeds. With its separate lines, rapid transit shows no such speed decrease; rather, overall speeds are generally

faster, with the benefits of greater passenger volume. Rail's strongest feature is speed coupled with reliability. For longer distances, air has the speed, but it is much more liable than rail to disruption by bad weather.

With the automobile becoming a greater and greater threat and burden to society, the alternative must be palatable. To extrapolate from Brian Cudahy's statements about subways in *Under the Sidewalks of New York*, systems must be made safe. Stations, rolling stock and personnel should be clean and attractive (such as Montreal's subway systems, which are all laid out by a different designer, with an emphasis on esthetics). The system should be made even more responsive to the public; hence prompt, regular service twenty-four hours a day. The fare should be subsidized from car taxes or tolls on all city bridges that accommodate autos. The system should be actively promoted the way General Motors (never a friend to mass transit) touts a new car, meaning city and state government support, and the hiring of administrators who have actual transit experience, not just administrative expertise. These seem like simple truisms, but their implementation is complex.

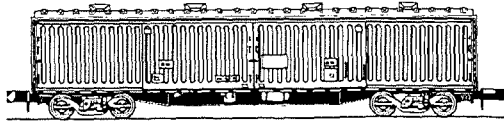
MONEY CHANGES EVERYTHING

Some U.S. studies have shown that trains must move at least twice as fast as cars, in convenient frequency, in order to convert substantial numbers of intercity motorists to train travel. This necessitates separate—expensive—lines to avoid slow traffic. The Urban Mass Transportation Act (UMTA) of 1964 allowed the federal government to provide up to two-thirds of the funds needed for expenditures on transit projects. Atlanta's 1979 subway, with its extensive commuter suburb services, was almost totally paid for by the UMTA. But a host of complexities and regulations makes it procedurally difficult to obtain national system-level federal funding, such as that provided for interstate highways. One funding option is for the state to acquire the land along rights of way and resell it to developers who stand to profit from transit traffic. Economic development from rail builds a stronger tax base that accelerates and continues the return on the initial transit investment. In Edmonton, Canada, developers footed significant funding for rail stations near shopping and residential areas, and the development has been successful. Yet, transit fares everywhere generally only pay for 40%–50% of operating expenses, so subsidy is inevitable. In 1979, Sweden instituted a 30% fare decrease for long-distance rail journeys that resulted in unexpected heavy revenue increases, but alternating increases and decreases of fares often doesn't produce the desired results. Fluctuating economic



L12000 Freight Car

conditions, good marketing and efficient operating systems will alter ridership, but banking on transit gold is bad banking.



40 Series Freight Car

To demonstrate the reliance of transit systems upon federal and state subsidy, the fourth largest mass transit system in the United States, the Southeastern Pennsylvania Transportation Authority (SEPTA) recently had to reduce service, close 30 miles of its line

and raise its base fare to \$1.50, the highest in the nation, because of recent proposals to cut federal and state aid. The chief operating officer (who oversees the nation's largest streetcar fleet in Philadelphia), even said that "a total shutdown is a real possibility." The 22,000 commuters who use the San Jose-San Francisco CalTrain were almost stranded because state funding deficits threatened the line's shutdown. An eleventh-hour multi-county joint purchase, helped by state rail bonds, put the service in the hands of a public agency.

But the news isn't all bad. The Senate recently passed a bill authorizing a radical overhaul of federal transportation policy that would give states vastly expanded authority to spend money as they choose on mass transit as well as highways. It remains to be seen if and how it will be implemented, but it's a welcome development. Rapid transit and light rail mileage doubled between 1960 and 1980 worldwide. Mass transit ridership was almost nine billion in 1990, the highest level on record. However, ridership gains in San Francisco, Los Angeles, Houston, Detroit, Miami, Atlanta and Boston were offset somewhat by declines in New York, Chicago and Philadelphia, cities where the aging transit infrastructure is most evident. Besides the obvious cities like London, Paris, and New York, LRVs are planned or operating in Tunis, Utrecht, Kuala Lumpur and across the globe. A new light rail system in Hanover, Germany has resulted in a 46% increase in the use of public transit. Singapore, Florence and Copenhagen all report successful new transit programs.

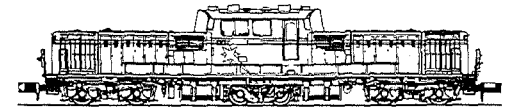
The initial implementation of rail systems requires a strong regional economy, often coordinated with a downtown redevelopment, organized local support (public and political), and the discouragement of auto traffic, either by reduced parking availability, higher fees, dedicated transit lanes or fuel taxes. The current recession may signal that the era of generous public money is over, but there are variable means to encourage the supplanting of the auto. At the very least, the use of bicycle lanes, carpools, vanpools, and high-occupancy vehicle lanes provide options to the single-car, single-driver dilemma.

THE FUTURE'S SO BRIGHT...

The marketplace of transit proposals is astir with dynamic offerings. Some cities contract out portions of their transit services to private operations, often realizing strong savings and better service under competition's gun. One of those private options is the "dial-a-bus," a circulating minibus to deliver riders from their homes to transit stops. There are dual-mode electric/diesel buses in England and Germany that operate electrically in the city to reduce pollution, and then are able to make trackless maneuvers to the suburbs. In Dallas, the Texas High Speed Rail Authority is authorizing a 50-year franchise to a European-based train manufacturer to build the first U.S. bullet train. The plan is to link Dallas with other large Texas cities by way of a 200-mph network. Those resourceful Texans are also going to build the nation's first urban monorail system, a 24-mile, billion-dollar-plus project for the downtown Houston area. In Nome, Alaska, officials are looking for investors and engineers to study the feasibility of building a 56-mile rail tunnel under the Bering Strait, linking Alaska and Siberia. The plan envisions farmers from the American Midwest sending grain and crops to Asia, and the industrial nations of Europe and Asia sending products to North American markets.

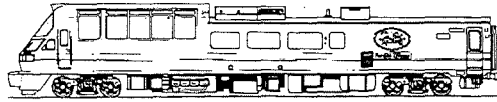
On the technology front, traffic engineers are designing Intelligent Vehicle/Highway Systems (IVHS) constituted of software and sensors embedded in highways and cars that relay critical, up-to-the-moment traffic information to drivers to enable them to avoid congestion. These "smart highways" are being introduced in Europe and Japan, and Los Angeles is seriously investigating their workings. The Federal Surface Transportation Act of 1991 will provide 150 million dollars a year for research for the project, investigating onboard car computers to control speed and braking and to sense obstacles ahead. This would allow cars to travel close together safely on a freeway, tripling carrying capacities. Another vision of the transit forecasters sees individual maglev vehicles driven onto maglev paths near people's homes, preserving our culturally insistent "me at the wheel" feel.

Some futurists see a true realization of the "global village" concept in the offing. In his essay, "Infrastructure for Movement," Cesare Marchetti suggests that future transportation strategies will offer the whole earth as a comfortable and efficient transit zone, with the implied complement of deep cross-cultural communication integrations. Today's air and



DD51 Diesel Locomotive

land transport advances allow "...corridors such as the Bosnywash {Boston, New York and Washington corridor} in the eastern United States and the Shinkansen corridor in Japan to actually operate as single cities—at least at the level of hierarchical information processing—but it is information bound to flesh..." We are the flesh by which this information circulates. Marchetti envisions airplanes capable of traveling up to eight times the speed of sound, and maglev systems in place worldwide, a consequence of what he charts as the historically predictable pattern of innovation in energy demand and application seen in transit history.



84 Series Diesel Car

Of course, innovations must find their moment in time; the innovative process for one element must address the limitations imposed by the whole. The introduction of a remarkably fast train would impose great strains on the timetabling and general operations of a railway designed to operate with standard trains. Also, the choice of motive power is but a small part of a large and complex operation, which often can only gradually alter as each component is updated and amended. Thus, changes are usually evolutionary, addressing small system adjustments and improvements, rather than revolutionary. Sometimes improvements are simply reactive, such as the increase of railway speeds in the sixties in response to the incursion of air and land transport competitors.

New highways or public transport facilities cannot be planned in isolation from the rest of the environment: transportation planning cannot be separated from urban land-use planning. Comprehensive strategies have to coordinate and integrate within the overall context of metropolitan utility. The "big picture" is the only true picture.

City planners and highway engineers can design with mass transit in mind, instead of designing for urban motoring and parking. That oft-quoted statement of a General Motors executive, "What's good for the country is good for General Motors, and what's good for General Motors is good for the country" is even less true today. Punitive measures that raise the cost of using a car may seem like a curtailment of conventional driving freedoms, even un-American to a degree, but the glutted roadways and sorry state of our skies makes a measure of sacrifice the sensible course.

Of course, sensible is not the only course one wants to take in life. There must be a course for imagination, reflection, history. The electric whoosh and gentle rockings of an interurban can sometimes distill a kind of mental quiet, where if you listen closely enough you might catch that incomparable noise, bittersweet and sublime, of a train whistle, and be brought back to that time when its uncommon sound thrilled the air. Now you are *truly* traveling.



The author resting at home with his dog Spot.